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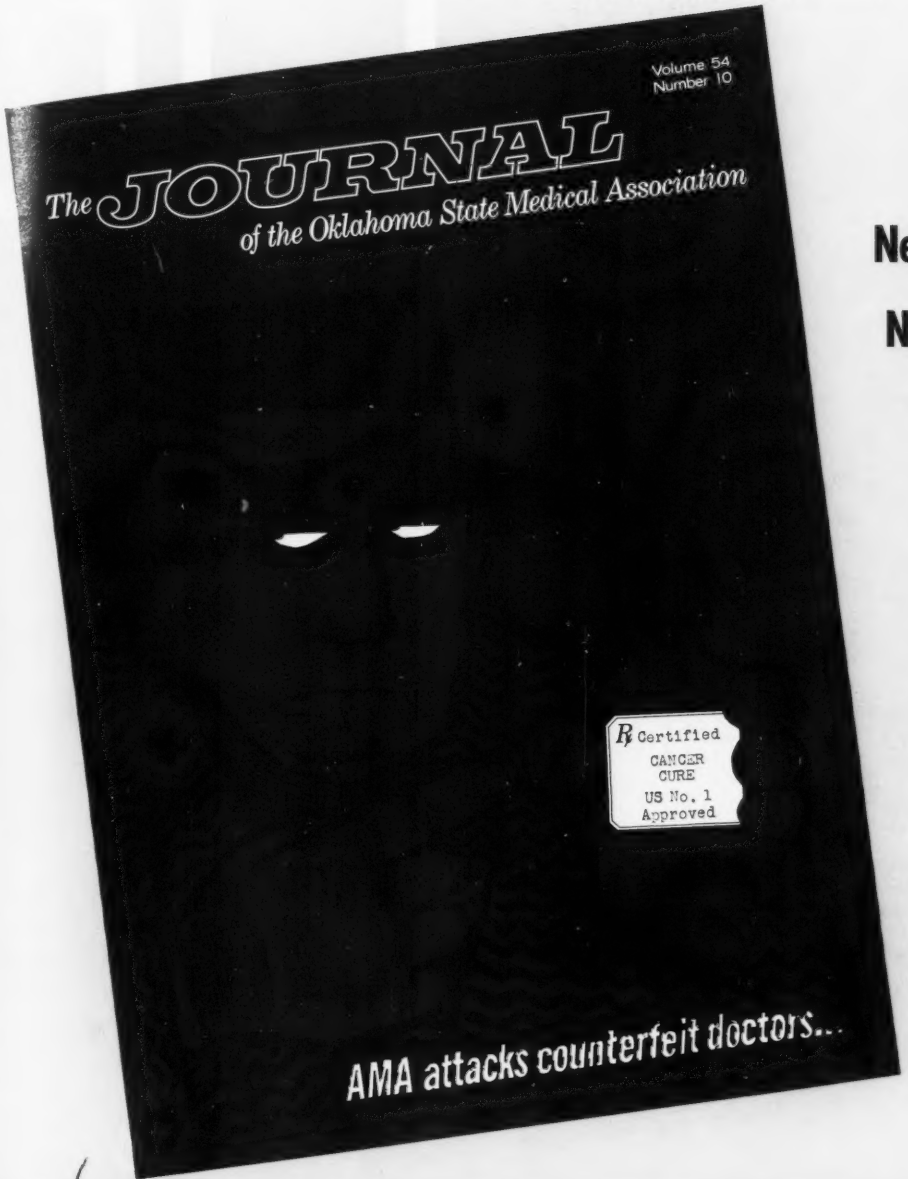
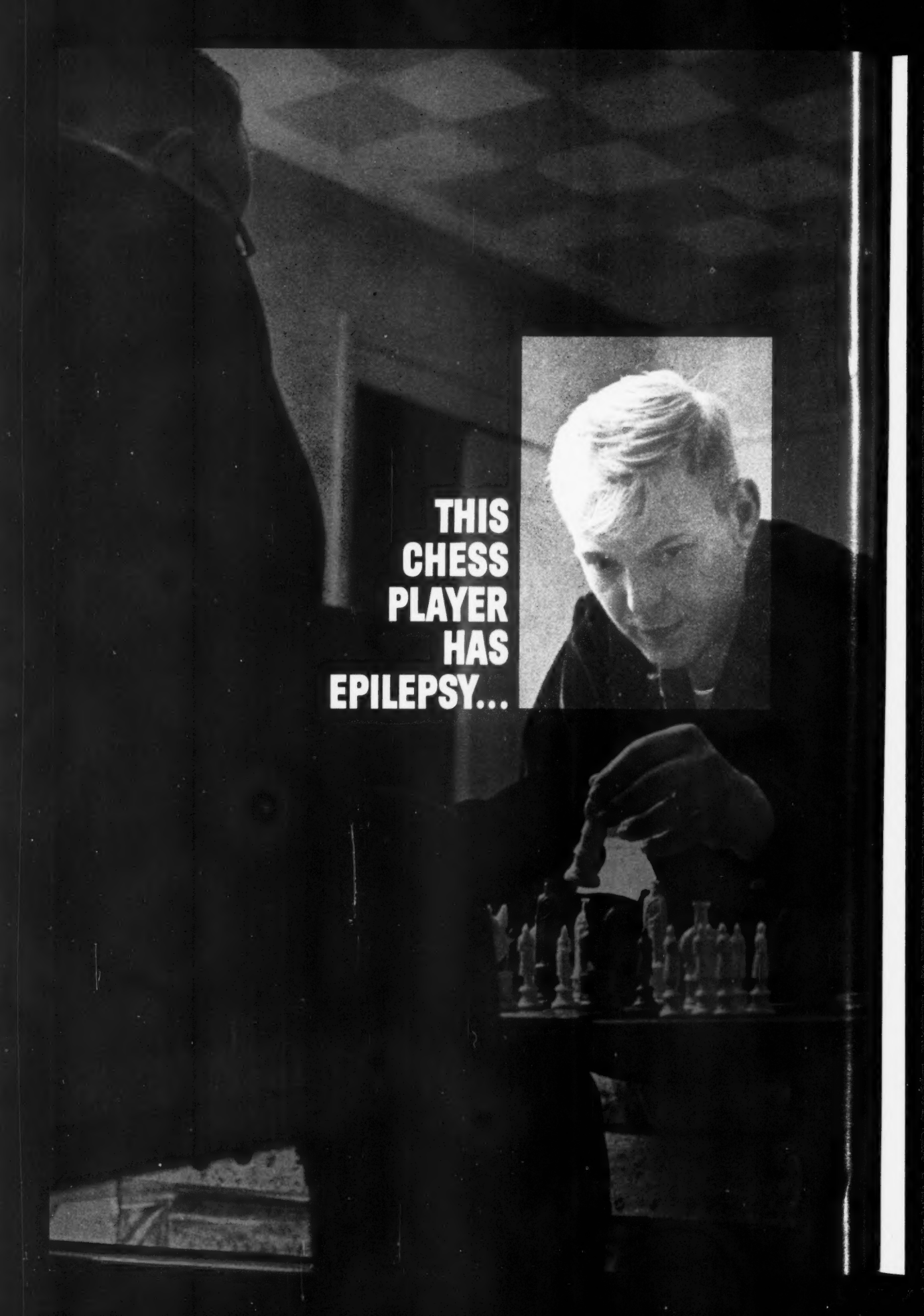


Next Month—
New Look for
the Journal


THIS
CHESS
PLAYER
HAS
EPILEPSY...

Editorials

Donald Wilton Branham, M.D.

1900-1961

Member of the Editorial Board

With the death of Don Branham, M.D., Oklahoma medicine has lost a part of the character which has made it what it is. There are not many who contribute more than good medicine and very few whose contribution gives real character to medicine. Branham was one of these.

His thoughts and actions and words seemed to be conditioned by a genuine humility which is not definable but which seemed to stem from an appreciation of people and things that were fine in medicine, in art, in music, in religion, in science and in society. He sensed his indebtedness to all of this for what he considered the life in him and this was reflected in his active interest in the County Society, in the School of Medicine, in the University, in civic affairs, in his church and in his family.

He is succeeded on the Editorial Board by Clarence Benton Dawson, M.D., a man who has many of the attributes and much of the same motivation, and from whom the *Journal* and the Association can expect a great deal.

An Appraisal

In the 18th century, the end of which is only two lifetimes away, there were typhoid, typhus, cholera, plague, yellow fever, malaria, smallpox and a host of other diseases and infections in whose power we were. Queen Mary died in 1694 during a smallpox epidemic, and Thomas Macaulay, in discussing this event, gives a vividly-colored picture of the impact of the disease:

"That disease over which science has since achieved a succession of glorious and beneficient victories, was the most terrible of all the ministers of death. The havoc of the plague had been far more rapid; but the plague had visited our shores only once or twice within living memory; and the smallpox was always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover."

In 1707, of the fifty thousand people who lived in Iceland, eighteen thousand died of smallpox. Thirty thousand died of it in Prussia in 1796. During this century, fifteen million people died of smallpox every twenty-five years. While the number of those who died was recorded, the number left blind, crippled, or deformed was not.

During this century, the *cost of care* was little, for there was not much to be had; the *cost of sickness* was tremendous—in fear, in heartache, in disappointment in loss of earning power, in loss of potential, in waste of life itself and even loss of money; the *cost of health* to the community—no cost at all—health for the community was not available at any price.

It was at this point in history that Edward Jenner pointed out the way to prevent smallpox, and preventive medicine was born. During the early part of the 19th century, the death rate in hospitals from

childbed fever was appalling. Neither Holmes nor Semmellwies was able to persuade the obstetricians to wash their hands, or preventive medicine would have grown faster. Anethestics were introduced in the 1840's, but surgery was a gory business, followed much too often by fatal infections. In 1867, Lister properly related Pasteur's work on fermentation to putrifaction of wounds, and both surgery and preventive medicine leaped forward. But for anesthesia and the prevention of infection, the glamour boys, the surgeons, would still be behind the candy-striped poles giving shaves and haircuts with an occasional amputation, abscess opening, or bullet probing thrown in.

At any rate, toward the end of the 19th century, the *cost of care* was going up, for effective care was becoming available; the *cost of sickness* was enormous, for there was still a host of preventable diseases not yet prevented; and the *cost of health* for the community was low, for it was not yet available except for the prevention of smallpox.

By the beginning of the 20th century, the work of Pasteur, Koch and many others began to pay off. We knew how typhoid, cholera and dysentary were transmitted, and typhoid vaccine was developed. We knew that mosquitoes transmitted malaria and yellow fever, and we were destroying or making harmless their breeding places. The first Pure Food and Drug Law was passed in 1906. By the time the sulfa drugs were introduced in 1936, we were able to prevent diphtheria, tetanus and whooping cough, and communities had made available safe water, milk and food for their people.

With the advent of drugs and antibiotics for the specific treatment of infection, the emphasis has changed to individual care; the surgeons are much freer now and have developed amazing techniques and procedures for the treatment of conditions long considered hopeless. The *cost of care* has gone rapidly up, the *cost of sickness* to the community has gone rapidly down, but the most precious thing we have, and the cheapest, is community health, which is now available to the degree that we are willing to provide it, and we, of all people, have no business taking it for granted or permitting others, particularly appropriators of money for that purpose, to do so.

Cover: Journalistic Face-Lifting

Ironically, most professional medical journals are produced by journalistic amateurs, and the J.O.S.M.A. is not exceptional in this regard. What we may lack in talent and training, however, is somewhat tempered by our enthusiasm for always trying to do a better job of competing for your reading time.

Those of us who work on the magazine each month are imbued with a feeling of responsibility to produce an interesting publication; a feeling which undoubtedly arises from our recognition that the *Journal* is one association product which regularly and tangibly reaches every member across the state, and which should contribute—more than anything else—toward binding the OSMA membership together.

To achieve such an ambitious goal—by offering good reading material in a palatable form—we are not without our problems: Scientific material is always sparse in quantity, and sometimes in quality; news from most county societies is seldom available; more prestigous publications are "scooping" our coverage of national news items and attracting the works of some of our better scientific writers; and readership from the membership is not what it should be. These problems are not insurmountable, however, and we are taking an optimistic view of the future. As one step toward the revitalization of the *Journal*, we will introduce a *new look* to the publication with the October issue. The magazine format and typography will be changed throughout.

The strength and effectiveness of the *Journal* are directly related to its usefulness. Its usefulness is determined by its appeal to prospective *readers* and prospective *writers*. We hope you will find the face-lifted model more appealing to read and more readable —and that you will be struck with an overwhelming desire to contribute to it.

Remember that the *Journal* exists to serve you as a medium to exchange your information and ideas. Let's work together toward this end by welcoming our new *Journal* with increased interest and participation.

PRESIDENT'S LETTER

October will begin a new era in the history of the OSMA *Journal.* It will be a new magazine from cover-to-cover—dressed up in appearance—and even more interesting in content. This is the second time in recent years that a major overhaul has been made, indicative of our editors' interest in the continued improvement of this vital publication.

Senator Kefauver's anti-trust investigations of the drug industry have hurt all medical journals financially during the past year, because pharmaceutical houses, reacting to the purge, have curtailed their advertising budgets. The picture is expected to get somewhat brighter in the Fall, but we will have to watch it closely to stay out of trouble. The outcome of Kefauver's proposal to regulate the drug industry (S. 1552) will undoubtedly affect the future of the *Journal.*

Why, in the face of financial adversity, do we select this time for *Journal* improvement? First, because of an economic principle involved: *to retard or check falling sales by improving the product.* Secondly, we do it for the sake of a *better Journal.*

Journal advertisers (and the editors, too, I'm sure) would take great heart and more courageously defend their advertising policies if they *knew* their contributions to the state medical journals were receiving a fair amount of physician-interest.

You can help this cause, and the cause of our *Journal* in general, by *contributing* more and better material, by faithfully *reading* the magazine each month, and by offering constructive criticism. And it might not hurt to let the advertisers know how much you appreciate their support of the *Journal.*

Clinton Gallaher M. D.
President

Scientific Articles

Diagnosis and Management of the Urologic Patient in General Practice

R. J. PRENTISS, M.D. M. J. FEENEY, M.D.
R. B. MULLENIX, M.D. G. E. HOWE, M.D.

THE GENERAL MAN can diagnose accurately most urologic problems. He can treat many of them efficiently. Accurate historical review, complete physical examination, simple laboratory work, easily accomplished urologic and radiologic examinations are properly within the range of the practitioner. These will solve problems of diagnosis and plan of treatment in 90 per cent of the patients. In the others, even the urologist will have difficulty.

This discussion is not designed to be spectacular, nor filled with new or startling pearls. Accurate diagnosis and, hence, proper management have rarely resulted from rapid or intuitive thinking and action. Careful and complete historical inquiry, interpreted in the light of the physician's special knowledge of the meaning of symptoms, will indicate the diagnosis even before the physical examination. Complete and thorough physical survey, in the light of the history, usually settles the problem. Simple laboratory and radiologic procedures to be done by the practitioner will be indicated, and will help shape the final conclusion and indication for treatment.

The History

Disease of the genitourinary system may produce genital, urinary and systemic symptoms. Likewise, systemic disease can produce genitourinary symptoms. Therefore, complete knowledge of the patient is essential.

Urinary symptoms may be divided as arising from the bladder and urethra, or the kidney and ureter, but often are interrelated. In nature, they may be irritative, obstructive or neither, as is symptomless hematuria. Urinary symptoms in the female closely parallel those in the male.

Genital urology usually confines itself to the subjective genital complaints of the male. However, suburethral diverticula, tumor of the bladder or cystitis may produce female genital symptoms. The male genital history centers around sexual failures; malformations; urethral discharges; testicular swelling, pain and tenderness; and ill-defined perineal, inguinal, suprapubic and penile discomforts. Questions relative to sexual failures, hematospermia, ejaculatory pain are as important as the history of venereal or nonspecific discharges in the genital survey.

The recording of symptoms should include the frequency of urination in the day and night, the size and force of the stream, the speed and completeness of emptying the bladder, and the presence of stage voiding. This will indicate irritative or obstructive causes. Dysuria should be defined as initial, terminal, total, or as discomfort referred to

Presented by Doctor Prentiss before the 55th Annual Meeting of the Oklahoma State Medical Association, May 7-9, 1961.

the bladder and urethra unrelated to urination. Thus, discomfort due to infection or urethrotrigonitis is differentiated. The frequency should be correlated with the volume of each voiding, indicating polyuria or irritation of the bladder. Urgency with or without incontinence should be differentiated from loss of urine due to stress.

Initial and terminal hematuria arises from the bladder neck. Total hematuria suggests renal, but may be of vesical origin. Initial and terminal hematuria with terminal tenesmus indicates vesical causes associated with infection. Hematuria with clots and renal pain indicates supravesical disease. Clotted hematuria without renal pain indicates prostatic or vesical location. Symptomless hematuria suggests bladder, prostatic, or renal disease. Urethral bleeding indicates urethral or prostatic causes. Usually the latter are due to prostatitis or posterior urethritis.

Renal and/or ureteral pain is usually typical, but often is confused with musculoskeletal pain. Obstruction above the bladder produces variable degrees of pain arising in the costovertebral angle and radiating to the groin or testicle. Musculoskeletal pain may stimulate renal pain, but the latter never radiates upward from the costovertebral angle and is not influenced by positional changes. Nausea usually occurs after the onset of renal pain.

Systemic diseases may produce both genital and urinary symptoms. Cushing's disease and the adrenogenital syndrome exemplify genital manifestations secondary to pituitary and/or adrenal malfunction. Arteriolar disease with failure of urinary concentration may cause frequency and nocturia.

Physical Examination

The physical examination should include a general survey including the blood pressure, and inspection of the optic fundus in those suspected of arteriolar diseases. Percussion of the abdomen will define renal enlargements and the full bladder. Great care is necessary to localize tenderness in the kidney. Commonly, tenderness of the edge of the sacrospinalis below the 12th rib is interpreted as of renal origin, but, in fact, it has muscular-skeletal sources.

Genital survey should include specific palpation of the vas deferens, the epididymis and the testicle. The urethra can be felt throughout its course from the bladder neck to the meatus. In the female, careful inspection and palpation of the urethra will reveal the unsuspected diverticulum. No urinary complaint in the female can be diagnosed and treated without inspection of the cervix and bimanual palpation of the internal genitalia. Rectal examination should be included.

Digital palpation of the prostate settles many problems presented by the male. A normal prostate is of almond size, the Grade I enlargement like an English walnut, the Grade II the size of a small egg or golf ball, the Grade III as big as a large egg or lemon, and the Grade IV the size of an orange or larger (figure 1). Slurring of margin, undue softness or firmness suggests inflammatory change. Hardness, local nodules or fixation is suspicious of malignant change. The degree of tenderness of the prostate is not reliable; extreme reaction to palpation suggests functional hyperesthesia.

Laboratory

Necessary and helpful laboratory procedures easily within the armamentarium of general practice include: (1) routine chemical urinalysis; (2) specific gravity and pH; (3) microscopic examination of the centrifuged sediment or urethral discharges; (4) methylene blue stains of the sediment; (5) Gram stain of the sediment or discharge, if cocci are present; (6) microscopic examination of the first and second glass of urine in the male patient; (7) microscopic observation of prostatic secretion; (8) two-hour phenolsulfonphthalein excretion test; (9) blood urea nitrogen; (10) formal concentration test after Todd and Sanford;[1] (11) six consecutive daily morning and night urine tests for albumin; (12) semen examination; and (13) stone analysis.

The value of routine urinalysis is obvious. The second glass of male urine is necessary to differentiate anterior urethral from urinary infection. Methylene blue smears reveal the type of organism and help in se-

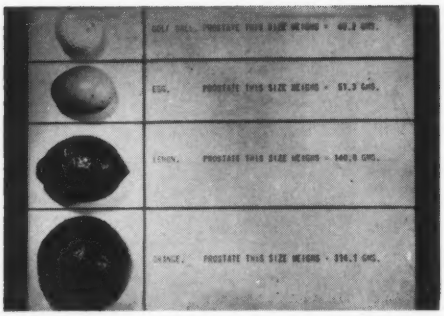


Figure 1. (left) Grading of the prostatic size by comparison with familiar objects.

Figure 2. (right) Flat film of abdomen (KUB), reveals stone near left spine of ischium, normal psoas shadow and renal outline.

lection of antiseptics; cultures are needed in resistant cases. Gram stains are needed to identify the gonococcus. Wet mount examination of prostatic secretion is simple, rapid and decides the presence or absence of prostatitis. The PSP test is simple, easily done with a simple comparator and gives an accurate index of total renal function. The concentration test requires a hydrometer only and is even more precise. The blood urea nitrogen determination is more complicated, but is well within the realm of simple laboratory technique. The six a.m. and p.m. albumin examinations will suggest or exclude orthostatic factors in the albuminuria of the adolescent.

Special Procedures

The flat film of the abdomen (KUB) delineates opaque stones, abnormalities of the renal and psoas outlines, displacement of organs and suggests the full bladder (figure 2). The excretory urogram, which is more valuable, reveals displacement, deformity and obstruction of the kidney, besides giving a partial indication of relative and total renal function. The excretory cystogram reveals diverticula, trabeculation, tumor defects and, in the oblique views, the intravesical prostate (figures 3A and 3B). A film of the bladder, after voiding, indicates presence or absence of residual urine.

Urethral catheterization, with a Number 14 or 16 French olive tip coudé rubber catheter, is simple and fruitful. In the male, the urethra should be filled with water-soluble jelly; if this is done, failure occurs only in severe urethral stricture. The catheter reveals the presence of a stricture, the residual urine, and enables one to make anterior-posterior five per cent sodium iodide cystograms and oblique air cystograms (figures 4 and 5). This allows evaluation of the bladder and prostate in obstructive problems. Air and sodium iodide are readily available.

The urethral catheter is extremely important for women presenting pyuria or bacteruria on voided specimens. Never make decisions relative to infection based on ab-

Figure 3. A. (left) Excretory urogram depicts Grade I-II irregular bladder and intravesical protrusion of the median lobe of prostate. Film made after voiding was similar. B. (right) Excretory cystogram revealing right lateral filling defect, typical of bladder tumor.

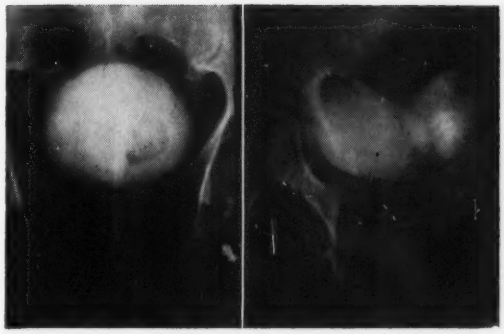


Figure 4. On the left is a normal NaI cystogram. On the right, oblique cystogram reveals a large diverticulum.

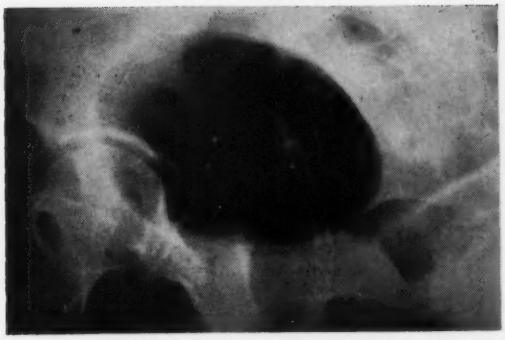


Figure 5. Oblique air cystogram reveals Grade II or more intravesical protrusion of the prostate.

normal findings in the voided female urine. Corroboration by anaylsis of the catheter specimen is necessary.

Specific Problems

The methodology presented above, applied routinely, will lead to diagnosis, plan of treatment or indication for referral. A few common problems will be discussed below.

Women: Women presenting bladder consciousness and urinary frequency with normal urine usually have urethrotrigonitis with functional aggravation. Since the condition is chronic or recurrent, excretory urograms and determination of residual urine are mandatory. If antispasmodics, sedatives, urethral dilatation, astringent instillation and irrigation do not relieve promptly, urologic consultation is wise to exclude Hunner's ulcer or other disease.

Women presenting acute dysuria, frequency, tenesmus and hematuria are seen frequently. They have acute hemorrhagic cystitis. They should respond quickly with simple antiseptics. The latter should continue for at least ten days to avoid relapse. If recurrence is noted, make excretory urograms. If still in doubt, urologic consultation is needed. Relapsing simple bacterial cystitis demands urologic investigation. Suspect traumatic causes incident to sexual intercourse, if all studies are negative.

Acute pyelonephritis is obvious, but the chronic form is not. The urine in chronic pyelonephritis may present few pus cells, but by routine staining of the centrifuged sediment one will discover bacteria. Antiseptics and frequent re-examination will prevent ultimate renal failure in these patients.

Children: Male children presenting urinary symptoms are more likely to have serious disease than female children. Girls may have repeated infection and ultimately recover without sequelae. Nevertheless, both sexes should be studied early with excretory urograms, at least, and early referral is the rule. If no obstructive disease is found in girls, urethral dilatation, voiding by the clock and consistent effort to empty the bladder will suffice. Since even urologists have difficulty in management of infection in girls, early referral is wise.

Bed-wetting in both sexes is functional in 99 per cent. However, after the fifth year, special studies are indicated to be safe, even if usual observation has suggested no abnormality.

In boys, meatal stricture should be corrected early with meatotomy, followed by bougie dilation in the 3-4 weeks healing period. Hydroceles are best treated surgically if they persist and enlarge despite aspiration. They may communicate with the peritoneum and, hence, hernia repair is needed as well. Undescended testicle should be proven by repeated examination, and observation by the parents at home. Once proven, anterior pituitary hormones should be given in the fourth or fifth year. Orchiopexy is done in the fifth or sixth year if medical treatment fails.[2,3,4]

Men: The commonest complaints presented by men are related to prostatitis in

the young and the obstructing prostate in the older man. Acute prostatitis is characterized by chills, fever, increased frequency, dysuria and hematuria. These patients should have excretory urography for confirmation and then antiseptics. They are symptomatically well in two or three days, but must be followed for 10-12 weeks. Massage is instituted after the third week and continued for 6-8 weeks or until the prostatic secretion is normal. Antiseptics are continued in reduced doses for 5-6 weeks.

Chronic prostatitis produces vague discomfort in the genital area. Since it is of long duration, careful study is necessary. Then prostatic massage, local heat, urethral sounding, and posterior instillation of one-half of one per cent silver nitrate will control the problem. Antibiotics are of no value in this condition.

Nonspecific urethral discharge and epididymitis are usually secondary to prostatitis. In the acute phase, antiseptics are indicated. To gain ultimate cure, after the acute phase, treat the prostatitis. Vasectomy or epididymectomy may be necessary in relapsing epididymitis.

Nearly all men after the age of fifty years have an enlarging prostate. Regular rectal palpation is necessary to detect early cancer. Of equal importance is the decision as to when the obstruction should be eliminated. Subjective symptoms may make the decision. However, the physician should gather objective findings by means of renal function tests, excretory urogram, cystogram and residual urine determination. The man with a benign prostate, a normal urine, good renal function, a smooth bladder on cystography, residual urine varying from 30 to 90 cc. does not need prostatectomy. On the other hand, persistent residual urine, trabeculation of the bladder, diverticula, infection or renal failure demand prostatectomy regardless of the subjective complaint.[5,6,7,8]

Ureteral Stone

This is a common problem in both sexes. Ninety per cent of all stones will pass of themselves. The doctor's job is to: (1) relieve pain; (2) check renal function and identify the stone by excretory urography (figure 7); (3) control infection; (4) wait for the stone to pass, being ready to refer on indication; and (5) prevent new stones. The indications for urologic help are (1) intractable pain; (2) uncontrollable infection; (3) absent or inadequate contralateral kidney; (4) lack of progress after 4-5 days; (5) a stone larger than 8-10 mm., making spontaneous passage unlikely; (6) persistent ileus; (7) general deterioration; (8) small but irregular stone fixed in upper or middle one-third of the ureter; (9) serious pre-existing obstruction; (10) doubt as to diagnosis; and (11) persistent non-function of the affected kidney for more than seven days. Despite this formidable list of referral indications, the doctor and patient can take comfort in the fact that 90 per cent will pass, and that, as in pregnancy, labor is necessary before delivery.[9]

Emergencies

Basic diagnostic steps are as important in

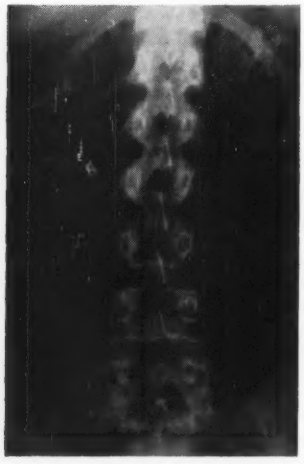


Figure 6. (left) Excretory urogram reveals caliceal dilation, blunting and irregularity typical of chronic pyelonephritis.

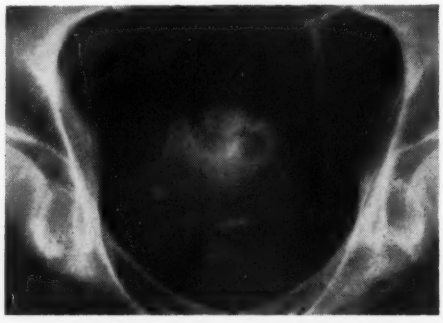


Figure 7. (right) Excretory urogram reveals dilated ureter surrounding juxtavesical ureteral stone.

Figure 8. Excretory urogram reveals moderate injury to left kidney. Treatment is conservative with recovery.

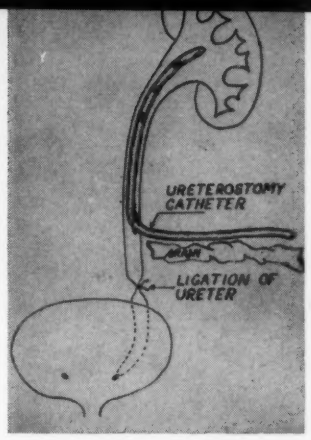


Figure 9. Schematic diagram illustrates intubated ureterostomy solving immediate problem of ureteral injury.

emergencies as in the routine problem. Renal injury may be handled conservatively with rest, antiseptics and careful observation after excretory urography has shown a normal opposite kidney and only moderate damage to the one affected (figure 8). Three weeks' rest is mandatory. Repeated excretory studies should show favorable progress. Have a unit of blood ready in case of sudden secondary hemorrhage. If there is doubt, refer immediately. Exploration of the injured kidney usually results in nephrectomy, so, if the general situation is stable, observation is proper.

The control of ureteral injury in the course of pelvic operations is a complicated problem. If the practitioner recognizes it, the principles of splinting, diversion and extraperitoneal drainage should be followed. In the operating room, the safest thing to do is to place a Number 8 French urethral catheter in the cut proximal end of the ureter and exteriorize the tube extraperitoneally through a stab incision (figure 9). This will preserve the proximal ureter for future definitive treatment. If time and the patient's condition permit, ureteroneocystostomy may be done with the long proximal segment. If the surgeon feels able, end-to-end anastomosis over a splinting catheter placed from above the union with a second ureterostomy tube for diversion is proper. If the injury is discovered late, intubated ureterostomy through a muscle-splitting extraperitoneal approach to the middle one-third of the ureter saves the kidney, and allows the patient to recover. Later, definitive repair will be conducted by the urologist.[10,11]

Rupture of the bladder occurs in pelvic fractures. It is diagnosed accurately with opaque cystograms (figure 10). In the male, this requires repair, cystostomy and extraperitoneal drainage. In the female, it requires repair, extraperitoneal drainage and urethral catheter drainage.

Rupture of the urethra also occurs in pelvic injuries. A urethrogram with aqueous organic iodide will diagnose the degree and extent (figure 11). If a catheter will pass, nothing more is needed. If not, cystostomy with retrograde catheterization is needed. If there is separation of the prostate from the urethra, cystostomy and re-establishment of continuity is necessary. The practitioner would be wise to have consultation on all but the simplest of urethral injuries.

Most injuries to the scrotum and testicle may be treated conservatively. Large hematomata should be evacuated and the injury repaired. Torsion of the testicle requires immediate operation; even then, the great majority will have to be removed. Epididymitis may simulate torsion; it is better to operate, and be wrong, than to miss a torsion.

Complete urinary retention requires catheterization. If all attempts fail to negotiate the urethra, evacuation of the bladder by

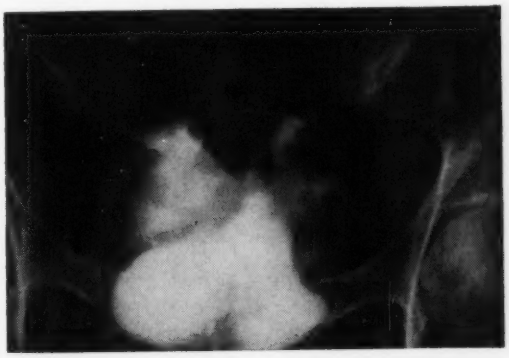


Figure 10. Sodium iodide cystogram reveals rupture of bladder with intraperitoneal extravasation.

Figure 11. Skiodan (40 per cent) urethrogram reveals rupture of membranous urethra. Bladder visualized. Catheter was passed into bladder and patient recovered.

suprapubic needle puncture is proper. If retention occurs due to hemorrhage from the prostate, place a Number 22 French catheter far into the bladder to withdraw the supernatant urine to relieve the patient. Refer to the urologist for evacuation of the clots and further study.

Common Mistakes

We have observed certain common errors committed by general men in the handling of urologic problems. Women are frequently referred because of pyuria based on examination of voided specimens. We would emphasize that pyuria in females demands catheterization for verification.

Acute prostatitis is often mistaken for urinary retention because the patient is straining to void extremely frequently. This has led to catheterization; instrumentation should be avoided in acute prostatitis. In contradistinction to this, we see men treated for infection, which they have, but which is secondary to a full bladder. Such problems demand catheterization. Examination of the abdomen differentiates between the two conditions.

Hematuria is notoriously intermittent, especially if due to malignant disease of the urinary system. Many times, patients are treated for infection because of concomitant pyuria. The bleeding stops, and the patient is happy. This cycle repeats itself until finally proper examination is obtained. Hematuria must be investigated.

Patients commonly refer to back pain as "My kidneys are hurting." Family doctors often agree with them. Most back pains in the area of the costovertebral angle are due to musculoskeletal causes. Careful history, examination and excretory urography should eliminate this error.

While we have recommended excretory urography as a good diagnostic tool for the practitioner, we would caution that one should not attempt to interpret inadequate pyelograms. They are purely screening, and any doubt should be resolved by urologic consultation.

Finally, attention to detail of urethral catheterization is often omitted, leading to failure to negotiate the urethra. We would emphasize that the urethra should be filled with lubricating jelly and a Number 14 or 16 olive-tip coudé catheter of recent vintage should be employed. If such is done, you will rarely fail.

Conclusion

We have presented the necessity of methodology in the historical review, physical examination, laboratory survey and simple radiologic examinations. We have attempted to show that all of these steps are proper and within the practitioner's orbit. Careful application will solve most problems. We have discussed many of the common conditions, and have suggested points of prime care and indications for consultation. Common sense and conscientious observation will save the patient for the practitioner, and the patient from expensive consultation.

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MAMMAPLASTY

Reduction and Augmentation

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"ALL MEN AND WOMEN are created equal"; so goes the quotation. But fortunately or unfortunately all do not develop to the same degree in the same places. Some parts of the body grow too large while others are stunted in their degree of maturation. Such is the story of the female breast. The reduction or augmenting of the breast is a procedure which is here to stay. All physicians should be familiar with the accepted techniques so they can inform their patients intelligently about them instead of having these women led astray by lay magazine articles.

History

As early as three thousand B.C. primitive corsets and brassieres were in use among Minoans to emphasize the bosom and diminish the waist. In the Christian era, the breasts were concealed beneath full flowing draperies which remained in vogue until the Crusades. By the fifteenth century tastes had again changed and the breasts of growing girls were suppressed by the use of metal plates. In western Europe the full raised bosom was again brought "to the front," so to speak, by the sixteenth century. Except for a very short "flat boyish chest" era in the nineteen twenties firm full busts serve as a starting point for fashions and have attained great esthetic value.

While many ancient cultures revealed an interest in mammary deformities, there is no early record of attempts to correct them comparable to primitive ventures into rhinoplasty. The first description of an operation for the repair of pendulous, hypertrophic breasts was Durston's.[1] On performing a mastectomy for this condition in 1669 he found "nothing but prodigious bigness." Almost two centuries lapsed before a further allusion to the subject appeared in the medical literature. In 1857 Velpeau[2] published the first systematic study of mastoptosis. From that point on interest in mammaplasty slowly but steadily increased. By the early part of the current century more than one eminent surgeon recognized the damaging effects of breast deformities and acknowledged their repair as a legitimate surgical concern. Many of the early attempts at correction of breast deformities failed in hypertrophic breasts because the surgeon did not reduce the size of the gland itself and did not form an adequate upholding skin brassiere. Also many of the early attempts were discarded because of the very marked scarring of the upper portion of the breasts which followed the primitive techniques.

Girard[3] first attacked a mammaplasty from the submammary fold area. He also recognized the fact that not only was it necessary to reduce the size of the gland itself but also to excise the redundant skin and repair it in such a fashion as to give an adequate skin brassiere. Following this great step forward there developed two schools of thought regarding the reduction mammaplasty, one being those who favored transpositioning of the nipple and others who favored free transplantation of the nipple. This difference of opinion exists even today although the indications for each type of procedure are quite clear in modern day surgery.

In very early times, attempts were also

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made to enhance the size of the breasts mostly with injection of different materials especially paraffin. Many of these patients developed carcinoma or at least paraffinomas and the breasts had to be amputated because of this complication. Then, too, the shape was never assured because it depended a great deal on the temperature, pressure and other outside elements. In the past five years, however, many new synthetic compounds have been discovered and several have been found to be quite inert when inserted below the body surface. The ideal, of course, would be if we were able to take tissue from some people and implant it into others, but at the present time, tissue transplantation has not reached that level. It is entirely conceivable, however, that in the not too distant future such transplantation of tissues will be possible. Until that time it is necessary, if we are to enhance the bosom, to use and depend upon the inert synthetic compounds which are now available.

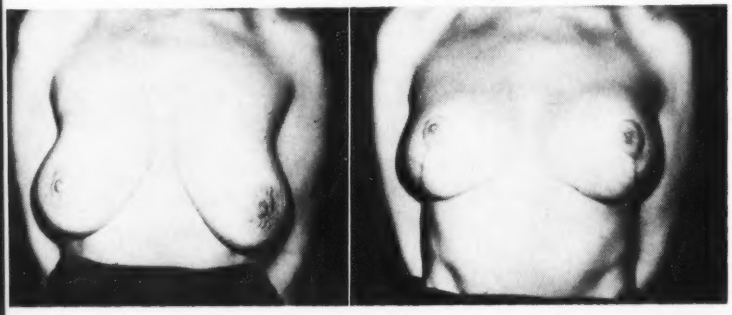


Figure 1. Reduction mammaplasty by transposition of of nipple.

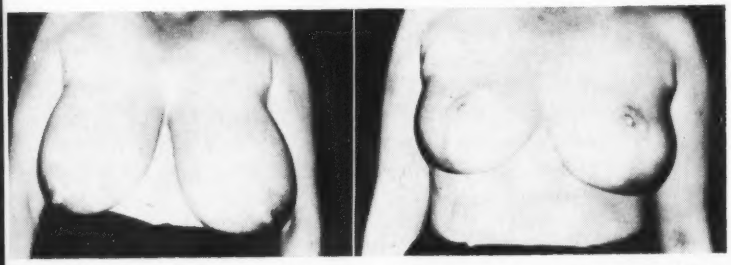


Figure 2. Reduction mammaplasty by transplantation of nipple.

Reduction Mammaplasty

So many different types of procedures have been fashioned for reduction of large dependent breasts that it is impossible to enumerate all of them or even to go into detail about the techniques of any.[4] Essentially what is to be accomplished is excision of over abundant breast tissue and fat plus excision of the redundant skin, thus forming a good skin brassiere to help hold the breast in its new position. Prior to the making of this skin brassiere the newly molded breast should be attached to the pectoral fascia with several large sutures in order to make certain that it will be held in that position by these sutures as well as by the skin brassiere.

As stated previously, there are two main methods of reduction mammaplasty. Namely, that of transposition of the nipple in which the nipple is not detached from the breast tissue itself but is moved to its new position along with the newly formed breast (figure 1). The other method is transplantation of the nipple where the nipple is actually removed and after forming the new breast in its new position a portion of skin is removed in the area where the nipple should be and the free transplant is sutured into the area (figure 2). By and large, most people lean toward transposition because this type of repair does not interfere in any way with the function of the breast and still gives good outlet for the lactiferous ducts. Also there is less chance of losing a nipple from lack of blood supply with the transposition technique than there is with the transplantation technique. In such cases, however, where the breasts are tremendous and have actually never really functioned as breast tissue itself then transplantation is probably the procedure of choice. Both methods can accomplish the desired goal of not only to reduce the size of the breast but also to put the breast back into its normal position in case it has drooped markedly. These procedures have been done for a number of years and the literature is filled with articles about them and the different techniques which can be employed. Therefore, it would seem advisable to spend less time on the accepted procedure of reduction and proceed to the modern and somewhat controversial topic of "augmentation mammaplasty."

Augmentation Mammaplasty

The rising tide of demands for augmentation mammaplasty must give cause for serious reflection on the part of physicians in general and the plastic surgeons in particular. Literally thousands of women in this country alone are seriously disturbed by feelings of inadequacy in regard to concepts of the body image. Partly as a result of exposure to advertising propaganda and questionable publicity, many physically normal women develop an almost paralyzing self-consciousness focused on the feeling that they do not have the correct size bosom. Regardless of what one thinks, these peoples' lives and often the lives of their husbands and families are made miserable by the development of such conflicts. Before embarking upon any type of augmentation mammaplasty one should be doubly sure that the patient is emotionally stable and understands completely just exactly what the operation can do and how it will be carried out. Without this prior understanding between patient and physician, catastrophe may follow.[5]

Older operations using pedicle flaps of the latissimus dorsi muscle, dermal fat grafts from the buttocks, or even the primitive use of the injection of paraffin have not given good results. Therefore, when a simple and safe implant became available and adequate laboratory studies had revealed that it was non-carcinogenic, its value could hardly be questioned. The synthetic compounds which have been utilized over the last ten years are ivalon, polyethylene, polyurethane, and polyether foam.[6] The latter appears to be the most popular and the one used most often by the plastic surgeons who are performing this operation. The results are uniformly good and the complications are minimal.

A great concern of both the surgeon and his patient is whether or not this type of procedure would enhance the possibility of developing carcinoma of the breast. As was stated previously, prior to the time of actually performing this operation upon any human being, many laboratory animals were subjected to insertion of these compounds and none of them developed any carcinogenic tendencies. Also, of all the implants which have been utilized in humans thus far there is as yet not a single case reported which has developed carcinoma. Of course, some of the persons who have had the operation performed will develop carcinoma but it is the feeling of the people who are doing this operation that the implant would not be the cause of the carcinoma. In other words, there are a certain number of people who are going to develop carcinoma and statistically at least the implant has not increased this number.

Operative Technique

To repeat, the patient is advised of all phases of the operation including any possible post-operative complication, the post-operative firmness, swelling, incision lines and so forth before the operation is ever undertaken. She is instructed to wash her chest and axillae thoroughly twice a day with pHisoHex* two days prior to the operation. She is admitted to the hospital the night before operation and routine pre-operative care is carried out. The operating room personnel is limited to those who are actually necessary to carry out the procedure and all persons in the operating room wear double masks. Conversation is limited.

The operation is performed under general endotracheal anesthesia with the patient in the flat position. The chest and axillae are again thoroughly scrubbed with pHisoHex and sterile drapes are applied. An incision of about two and a half to three inches is made in the submammary fold or approximately four inches below the nipple. In small breasts it is at times necessary to drop the incision line lower on the chest wall to prevent the nipple being held too dependent or the scar being on the new formed breast convexity (figure 3). All the small fat lobules which project into the incision are removed. Hemostasis is accomplished with electro-coagulation. The incision is deepened down to the pectoralis fascia. Following this the breast is elevated off the fascia with both blunt and sharp dissection. The amount of undermining needed will depend upon the size of the prosthesis that is to be inserted. The actual space should be greater than the prosthesis because if this is not created then

*Winthrop.®

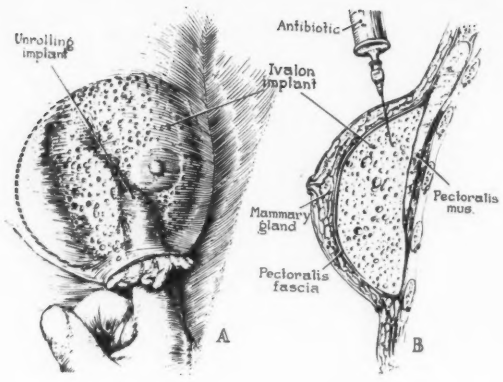


Figure 3. The insertion of the implant on the left and a cross section of the chest wall to show the position of the implant and the injection of an antibiotic.

there is a tendency for contracture of the scar tissue to extrude the implant as healing takes place. During the entire dissection no breast tissue is seen, the entire breast being elevated off the underlying pectoralis fascia. Perfect hemostasis is absolutely imperative. After adequate undermining has been accomplished, the prosthesis is inserted and tested to see if there is adequate space into which it is to fit, being careful to avoid any wrinkling or doubling over of the prosthesis during the time of the insertion. A small stab wound is made lateral to the incision and a drain is inserted between the prosthesis and the chest wall itself. One half million units of penicillin in five cc of water is injected into each implant. The wound is closed in routine fashion using four-zero white silk sutures for the subcutaneous tissues and five-zero black silk sutures for the skin edges. Dry sterile dressings are applied and a routine circular breast binder type of dressing is also employed.

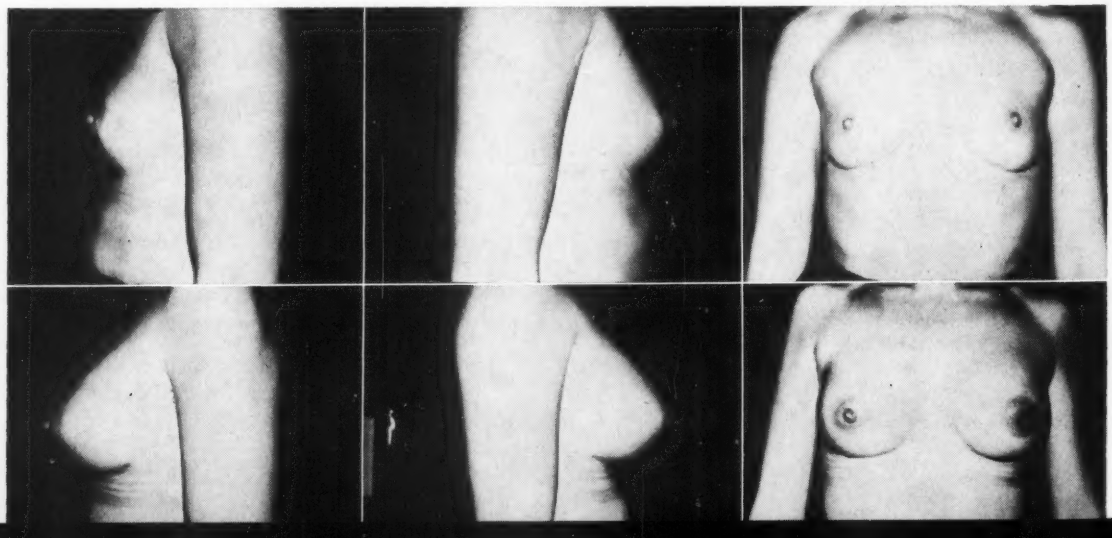
Post-Operative Care

The patient is kept on an antibiotic therapy, preferably penicillin unless she is allergic to it, for the entire hospital stay which will vary from three to five days. Twenty-four hours after the operation the large dressing is changed and the drains are removed. A very small dressing is then applied over the suture lines and the area from which the drain was taken. The patient is instructed to move her arms as little as possible and especially not to try to abduct the upper arms too far from the chest wall. The patient will usually cooperate very well in this because of the pain which she will have when moving her arms too much in the immediate post-operative period. The patients are allowed out of bed on the second post-operative day and on the third post-operative day all dressings are removed. The suture lines are covered with a coating of rezifilm and she is allowed to go home if there are no contraindications. The sutures are removed on the fifth post-operative day and she is allowed to wear a brassiere if desired after one week. She is encouraged to continue limited motion of her arms for approximately ten days to two weeks following the operation.

Complications

The most serious complication, of course, in such an operation, is the development of an infection which would in itself preclude the removal of the implant. In order to avoid any possible complications three im-

Figure 4. Augmentation mammaplasty with polyether foam implant (Comparative photographs arranged vertically.)



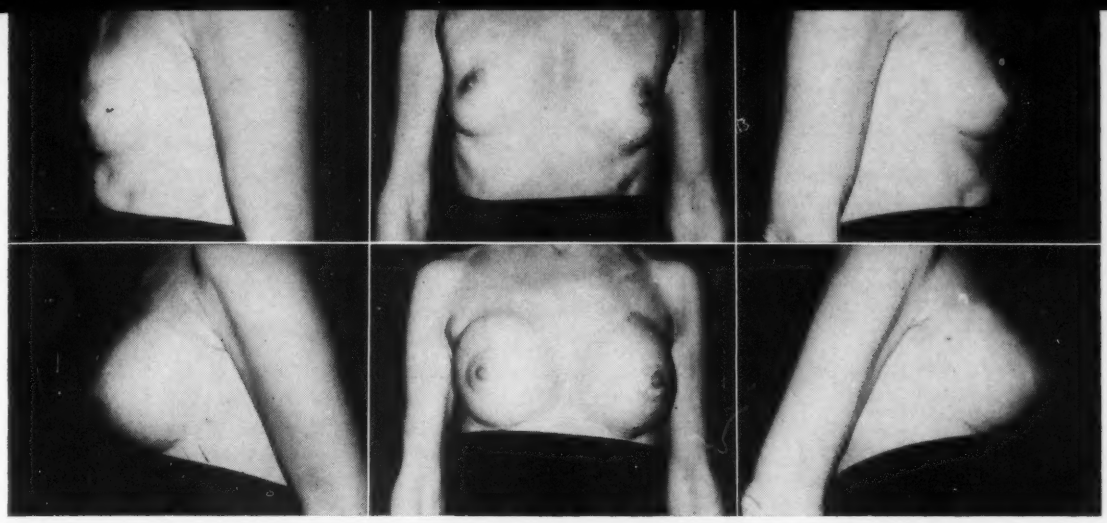


Figure 5. Augmentation mammaplasty with polyether foam implant. (Comparative photographs arranged vertically.)

portant steps in the procedure should be meticulously followed. One: *absolute hemostasis*, for if any blood collections do develop in and about the implant certainly this would enhance the development of infection. Two: *absolute sterile technique*. All precautions are taken to remove any possibility of infection in these patients. Third: probably one of the most important, or at least as important as the first two, is that the *space in which the insert is to be placed should be adequate to receive it*. Any time an implant is "stuffed" into a small pocket then you can be reasonably sure that it will have to be removed or will remove itself by extrusion. There is a moderate amount of edema following the operation but this very rapidly disappears within the first two to three weeks after the operation. The implants become quite firm but they are not stony hard and this has not been a complication about which the patients complain. For the first five to six weeks after the operation, the implants are fast against the chest wall but gradually loosen and become quite mobile. One should not try to speed the mobility of the implant because this in turn might cause bleeding and would even further the adherence of the implant to the anterior chest wall.

Results

The results are universally good if the accepted technique and the special points mentioned above are followed (figures 4 and 5). Practically all the patients are extremely pleased with the results of their operation and many spontaneously will use the phrase "it" (the operation) "has changed my entire life." One of the most gratifying aspects of the whole procedure is that many patients lose their "breast centered" orientation and take up many activities of a more extroverted nature. It has also been noted (contrary to initial thoughts) that satisfaction following the operation does hold up and the patients do not develop other problems or obsessions.

Conclusion

Mammaplasty whether performed for reduction of the size of the breasts or to increase the size of the breasts is an acceptable procedure. Careful screening of patients for any marked emotional disturbances should be carried out prior to the operation. The exact technique of the operation as well as the results to be anticipated should be carefully explained to the patient. In all operations, but in this one particularly, the surgeon-patient relationship is of prime importance.

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Too often physicians and patients alike assume that surgery is the ultimate treatment in intervertebral disk injuries. Not so! Good results can be attained with conservative methods if all details in management are followed.

Conservative Management of Intervertebral Disk Injuries

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IN 1934 Mixter and Barr[1] called attention to a new clinico-pathologic entity by demonstrating the presence of ruptured intervertebral disks in many cases of severe back and sciatic pain which were accompanied by meager neurologic findings. This classical study pointed out that nerve root compression, as a result of pathology in the intervertebral disk was a common cause of sciatic pain. Prior to that time it was thought, on the basis of post-mortem studies, that the underlying lesions were a true neoplasm, thus they were designated by a variety of terms such as chondroma, fibrochondroma and ecchrondosis.

A great portion of the literature on this subject has been produced by orthopaedic and neurologic surgeons who were preoccupied with the surgical approaches to the problem. A great argument has arisen as to whether fusion or nonfusion is indicated after laminectomy; whether wide or minimal laminectomy offers the best results and whether interbody, "H" grafts or facet fusions offer advantage.

Lumbago, backache and sciatica are frequent complaints heard in all fields of medicine. It is not surprising that a great portion of the laity have come to feel that very little can be done for backache and are confused and disturbed by the diversity of opinion among physicians on the management of backache, particularly in relation to intervertebral disk pathology. As a result large numbers of apparently sensible, intelligent citizens almost immediately seek the aid of unorthodox practitioners and cultists rather than their physicians when they experience the symptoms of acute back pain. Even some physicians think that very little can be done for an acute or chronic back problem in spite of the claims and counter-claims for various surgical procedures.[3] It should be further pointed out that while the greatest interest and the greatest number of studies, in relation to intervertebral disk conditions, have been made by orthopaedic and neurologic surgeons very little data and reports on this subject have appeared from other practitioners of medicine, such as industrial surgeons, general surgeons, rheumatologists, internists and general physi-

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cians who obviously are confronted with vast numbers of back injuries. Perhaps because of the many glowing reports in the world literature on the efficacy of the surgical treatment of the intervertebral disk there has evolved a general acceptance of surgery as the treatment of choice in the management of intervertebral disk injuries. Decker[2] states that there is agreement that symptomatic lumbar disk herniation requires surgical removal of the disk and this general attitude prevails at this time. The average physician, when faced with a patient demonstrating signs of intervertebral disk pathology, immediately assumes that surgical intervention is not only desirable but is urgently needed. On the other hand all physicians are regretfully aware of many patients who are not improved following intervertebral disk surgery. It is not surprising that a large segment of the population of this country exhibits a growing skepticism of our ability to solve the problem of backache, sciatica and intervertebral disk pathology by surgical means. Certainly the entire solution to this problem has not been proposed and consideration from another standpoint . . . the standpoint of non-surgical treatment . . . merits further study.

Recently there has been a greater emphasis on the conservative management of intervertebral disk injuries.[3,4,5,6] In reviewing this development it is apparent that differences of opinion regarding various phases of management of patients with suspected herniated disks do exist. The purpose of this paper therefore is to review some of these differences, with particular emphasis on the desirability and advantages of conservative treatment, and to report my experience in the management of forty-two (42) cases in which Prolotherapy techniques of Hackett[4,5] were employed.

In coming to the conclusion that conservative management of intervertebral disk problems is desirable and generally the treatment of choice, one is impressed with the fact that almost without exception there is agreement that each patient with an intervertebral disk problem should be given a trial of conservative treatment. The implication from this statement is that operation should be attempted only in those cases which do not respond to conservative treatment. This, of course, is a reasonable position but as a matter-of-fact many times conservative treatment is merely a gesture of a few days, or perhaps a week or two at most. If, at the end of that time, the patient has not achieved a fair degree of recovery the necessity for surgical intervention is immediately assumed. It is my firm conviction that many times not enough time or effort is directed toward conservative management of these patients to achieve the good results which are quite possible with this type of treatment. Recent reports emphasizing conservative treatment indicate that eighty to ninety per cent of patients with disk syndromes were satisfactorily relieved of their symptoms with conservative management.[9,13] Those authors reporting on the value and desirability of a conservative attitude in the management of disk injuries point out the necessity for adequate time,[12] complete rest and careful attention to detail.

Clinical Aspects of Intervertebral Disk Injuries

Many physicians are reluctant to assume responsibility for the treatment of disk injuries because of the difficulties in establishing an exact diagnosis. Frequently the assumption is made that complicated diagnostic procedures, such as myelograms, are necessary for an exact diagnosis of this condition. Bradford[1] has emphasized that the diagnosis of intervertebral disk injury is based primarily on clinical grounds and that any additional roentgenographic or laboratory information must be interpreted in the light of the history and physical examination.

History: Pain is usually the incapacitating symptom in a ruptured intervertebral disk. The location of the pain is extremely variable but most frequently patients will complain of pain *"in the hip."* Typical pain pathways are somewhat uncommon, however, this cannot be relied upon as a differential point. Any patient with complaints of severe low back pain, with radiation of pain to the gluteal area, the hip, the posterior aspect of the thigh or leg merits consideration as a possible disk problem. The relationship of pain to activity and rest is quite important.

It is of particular importance that attention be paid to the differentiation of types of pain resulting from other conditions which mimic intervertebral disk injuries. The problem of malingerers in compensation cases does not make the task easier. Inflammatory diseases, such as rheumatoid spondylitis, frequently present a type of pain somewhat radicular in nature which is extremely difficult to differentiate from true disk pathology. A well-coached claimant can present a thoroughly convincing description of classical sciatic pain. However, several points are available to help the physician to discern these differences. Table 1 is presented for this purpose.

The precipitating injury leading to intervertebral disk pathology is somewhat inconsistent. All degrees of physical injury can initiate disk pathology. These injuries can range from a simple maneuver, such as bending over for a piece of paper, a sneeze while the patient is lying in bed, to the obvious trauma resulting from automobile accidents, falls from buildings, etc. Among working men the commonest type of injury occurs when two men are carrying a heavy object and one of the men drops his end of the load and the other man exerts excessive physical effort to maintain the load for a few moments. Approximately twenty-eight per cent of patients present themselves with no history of injury whatsoever but will describe a long period of intermittent attacks over many years and increasing disability with each subsequent attack. It must be kept in mind that many times patients will develop such an awareness of the leg or sciatic pain that the back pain recedes in the patient's consciousness. The multiplicity of atypical pain patterns is often confusing to physicians; however, in general, with proper attention to details of the symptoms of disk injury they become meaningful and fit into fairly discrete patterns.

Physical Examination: Most physicians are familiar with the physical findings of intervertebral disk injuries and these will be only briefly reviewed. A few pertinent points demand emphasis. The patient must be disrobed and carefully inspected while walking and standing in addition to the other aspects of the examination. This will do more to eliminate uncertainty and confusion from the examiner's mind than any other single procedure in the course of making a diagnosis in the case of intervertebral disk injury. The objective physical findings can be divided into general and specific nerve root signs. The findings of importance are:

1. Flattening of the normal lordotic curve as evidence of muscle spasm.

2. Sciatic scoliosis . . . This is an extremely important objective finding which cannot be feigned by a malingerer.

3. A shift to the right or left as the patient flexes his spine.

4. Rigidity of the lumbar spine.

5. All movements of flexion, arising from hip flexion, is likewise of particular significance as a sign of intrinsic back pathology.

6. The straight leg raising tests, or Lasegue's test, while quite valid tests in themselves are frequently of little value in compensation cases.

This author has come to the conclusion that performing the straight leg raising test with the patient in the sitting position has much greater value.

7. The neurologic examination is particularly important in analyzing intervertebral disk injury and this must be performed in full detail.

8. Measurement of the thighs and calves . . . and leg lengths . . . determines muscular atrophy.

9. Sensory function should be evaluated. Frequently this is difficult in that suggestive patients say "yes" to anything.

10. The deep tendon reflexes, the Achilles' reflexes and the patellar reflexes should be routinely evaluated. Hyperactivity of a reflex is seldom of diagnostic significance or help. Weakness or absence of the deep tendon reflexes, particularly if unilateral, is of great aid in establishing a diagnosis. A more subtle observation of easy fatigability of one reflex or another is of help.

11. Pain on pressure and deep palpation over the course of the sciatic nerve, the iliolumbar ligamentary areas, the sciatic notch,

DIFFERENTIAL POINTS IN ANALYZING BACK PAIN*

	Arthritic Disease	Intervertebral Disks and Sprain Injuries	Psychomotor or malingering
Stiffness and soreness on arising in the A.M.	Marked and significant	Feels best after a night of rest	"Worse all the time" . . . "never better."
Complaints in predictable areas	Yes	Yes	No . . . Hurts everywhere.
Relieved, at least to a degree, by analgesics	Yes	Fair to moderate	Nothing helps
Affected by weather	Yes	No	No . . . At least not consistently.
Does pain awaken the patient at night?	Yes . . . Especially if an expanding lesion in bone. (Tumor or abscess) . . . No if the pathology is mild.	Not unless postural strain occurs. Relieved by changing positions.	No . . . May have insomnia from other causes.
Degree of pain proportionate to objective findings	Yes	No . . . particularly in early disk injuries.	No
Physical findings in predictable areas	Yes	Yes	No . . . Touch-me-not reaction.
Evidence or signs of organic disease	Apt to be present	Yes . . . If anatomical defect is cause of strain . . . Otherwise, No.	No
Radiographic change	Usually present	Only if anatomical defect is the cause.	No . . . If changes are present, not significant.
Laboratory change	Yes, if characteristic of disease	No	None pertinent to disease.

*Modified from Ishmael, Wm. K.: Problem of the Painful Spine: Oklahoma State Medical Journ. Nov. 55, pp. 375

TABLE 1

or the course of the sciatic nerve in the upper thigh and in the popliteal area will frequently indicate sciatic nerve root irritation.

Roentgenograms: AP and lateral projections of the lumbar spine must be of good quality. A spot-lateral film of the lumbosacral joint is desirable. Although occasionally intervertebral disk space narrowing may corroborate the diagnosis most frequently films are obtained to exclude, or diagnose, other lesions of the spine such as spondylolisthesis, bone tumors, osteoporosis, congenital anomalies, fractures or inflammatory conditions which may mimic disk injuries.

Myelography: Myelography is a most helpful procedure in *localizing* the compression of the nerve roots or cauda equina. Occasionally it is necessary as an aid in making the diagnosis of herniated lumbar intervertebral disk; however, it should be kept in mind that a significant percentage of error accompanies this procedure. Decker[2] reports myelography to be an accurate aid in localization in only seventy-nine (79) per cent of his cases. A great deal of controversy still exists in the value of myelography in the diagnosis of herniated intervertebral disk injuries. The greatest value lies primarily in the localization of the lesion in preparation for operation.

Since this paper is concerned with the conservative treatment of this disease the assumption is therefore made that it would indeed be a rare occasion where myelography would be necessary for clinical diagnosis of the lesion and the management of the patient. Therefore, myelography should be reserved primarily for those cases in which clear-cut indications for surgical interven-

tion exist and where aid is needed in localizing the level of the lesion.

Treatment

Surgical: It is the opinion of many authorities in this country[3,7,12] that there are three (3) clear-cut indications for surgical intervention in intervertebral disk injuries. These are summarized in table 2.

1. Economic factors.
2. Progressive or major neurologic deficits.
3. Intractable pain resulting from poor response to conservative treatment.

TABLE 2

Conservative Treatment: The general principle of conservative management of intervertebral disk injuries may be summarized as:

1. Rest
2. Heat
3. Time

Rest: Patients in acute pain with severe, bilateral muscle spasm, reversal of the lumbar curve, sciatic scoliosis, inability to move about without severe and recurrent spasms unquestionably require hospitalization. The simple problem of nursing care and attending to body functions renders home treatment relatively impractical. Bedrest in the hospital, on a firm bed in a flexed position, is the first step in the conservative management of these patients. Williams[12] has previously outlined the mechanical advantages of this treatment and others have repeatedly demonstrated that flexion of the spine causes an increase in the size of the intervertebral foramina and neural canal.

These patients should be placed at bedrest, either complete or with bathroom privileges depending upon the degree of muscle spasm, and should be kept at complete bedrest for at least several days until acute spasm has subsided. They should be maintained in the flexion position with the knees flexed and the head of the bed elevated during this entire period of time. If the patient becomes weary of the supine position then right or left decubitus, with the hips and knees flexed to maintain flexion in the lower spine, is permissable. Pelvic traction is most effective as an adjunct to conservative management. Pelvic traction offers some advantages over leg traction by ease of application, ease of movement and elimination of cutaneous irritation. It should be kept in mind that occasionally pelvic traction will aggravate the sciatic pain and in this instance it should be immediately discontinued. Results of treatment utilizing this method usually result in marked reduction of pain in from twenty to ninety-six hours, although occasionally periods of time up to seven to fourteen days may be necessary.

Drug Therapy: A wide variety of skeletal "muscular relaxants" has been offered in the past few years. Such drugs include mephanesin derivatives and zoxazolanine. Numerous reports have appeared recommending these relaxants as an adjunct to treatment and it is significant to note that none of these reports truly are based on any basic experimental data involving pure relaxation of skeletal muscles but rather they are clinical in nature. This author is unimpressed with the specific value of any of these muscular relaxants in the management of patients with back muscle spasm and intervertebral disk injuries. Curare, a skeletal muscle relaxant, acting at the myoneural junction seems to bring about some muscular relaxation and is of some help in relieving pain, particularly in the early management of a patient in acute back pain. Potent analgesic agents are of the greatest value in relieving muscle spasm and pain rather than any drugs advocated as specific muscle relaxants acting at the internuncial areas. On the other hand sedatives have obvious value in allaying apprehension, anxiety and tension of patients and they can be used liberally in the management of this aspect of the patient's health. A healthy skepticism of the alleged muscular relaxing drugs in the management of low back conditions and intervertebral disk injuries seems justifiable.

Back Supports: Occasionally a patient's symptomatology will be of such a nature particularly in the intermittent and recurrent intervertebral disk problems, that rest may be applied to the ambulatory patient through the use of a back support. While awkward and occasionally uncomfortable

and inconvenient they will nevertheless frequently serve as an effective compromise, particularly in cases where the patient simply cannot take time off from work to obtain the proper rest. For adequate support a wide corset, extending from the rib cage and enclosing the buttocks, is necessary. Extra stays may be added to these corset type garments. For severe chronic cases Duraluminum, leather covered supports in a variety of different designs, would be more effective.

Heat, etc.: The American public accepts the doctrine of heat, and the application of heat, to the back in the management of back conditions with probably more unanimity than any other aspect of therapeutics. The various ointments, lotions and salves and nostrums, designed as counterirritants emphasize this fact. Most Americans own a sun-lamp, heating-pad or hot-water-bottle which they apply with a great deal of enthusiasm and consistency. All modalities of heat apparently serve some symptomatic benefit in the management of acute back pain from intervertebral disk injuries. The mechanism of action is apparently through increased vascularity, reduction of muscle spasm and prevention of jelling phenomenae. Some authors[10] report advantages for ultrasonic applications, microtherm and other modalities of heat therapy. It is this author's observation that simple hot fomentations, applied to the patient's back with the patient in a slightly flexed position while prone over a roll of pillows, and with gentle hand massage, brings about as much symptomatic relief as any of the mechanical methods of heat application.

Time: One of the most common causes of failure to respond to conservative treatment in the case of acute back and sciatic pain, associated with intervertebral disk injuries is a general tendency to underestimate the factor of time. One simply cannot rehabilitate a patient with acute disk symptomatology with a few days in the hospital and a few days at home and get him back to work in two weeks.

These patients should be kept in the hospital, on a bedrest program with daily physical therapy treatments, in pelvic traction, until the pain is no longer present in the severe form and until he can stand erect without a list, undergo some movements of the back without severe triggering of paravertebral muscle spasm and until he is completely comfortable resting in bed in the flexed position. Approximately ten to fourteen days are required in acute disk injuries for response to treatment and for this state of recovery to be achieved. The patient can then be dismissed to his home to there continue on a similar program but with some increase in physical activity. He should be observed closely and carefully, on a weekly basis, and if necessary a back support should be applied to prevent recurrences of his difficulty if this is manifested from his history. At the end of approximately four weeks the acute pain, spasm and limitation of motion should have subsided to the point where a guided program of physical activity can be developed. *It is precisely at this stage that the patient should* NOT be returned to work since an almost immediate recurrence frequently develops. A far greater proportion of good results from conservative treatment will be obtained if the patient is granted an additional two to four weeks to complete his rehabilitation.

Flexion Exercises: Williams[12] devised the concept of flexion exercises many years ago. Flexion exercises strengthen and increase tone in the muscle fibers of the abdominal wall and lengthen lumbar muscles. When lordosis is lessened the tendency toward recurrence is minimized. After acute pain and spasm have subsided a progressive program of flexion exercises offers more to the patient, in terms of ultimate recovery, than any other single aspect of conservative treatment. To add a word of caution at this point . . . The exercise program *must not be initiated too early in the treatment* because a patient in acute pain and spasm from lumbar disk can have discomfort aggravated as a result of flexion exercises. Exercises should be reserved and used in the recovery and convalescent phase of disk injuries.

Prolotherapy

Another approach in the conservative treatment of back injuries is the Prolotherapy technique of Hackett.[4,5] The reports by this author have properly called attention to

the importance of ligamentary structures of the back in relation to the overall back problem. It is probable that these anatomical structures have been neglected generally in our thinking for many years. Hackett has also emphasized and reiterated the patterns of referred pain in the pelvis and legs, resulting from lesions of muscular and ligamentary structures in the low back. From his work we are able to more clearly differentiate *referred* pain in the extremities from *radicular* pain. The Prolotherapy technique is defined as "rehabilitation of an incompetent structure by the regeneration of new cellular tissue" and is based on the assumption of ligamentary and tendon relaxation or injury. By injection of a sclerosing or proliferating solution in the areas of fibro-osseous junctions of these tendons and ligaments, at their insertions, stimulation of healing and fibrosis allegedly results in elimination of the basic ligamentary weakness. Doctor Hackett has reported many thousands of cases treated in this manner, with reported good results in approximately eighty-two per cent.[4,5] There has been a considerable wave of enthusiasm among many physicians throughout the country and although as yet corroborating studies have failed to appear in any great number there is still considerable interest in this method of treatment.

In an effort to evaluate this technique a study was initiated in 1958 in a highly selected group of patients, utilizing the Prolotherapy techniques as outlined by Doctor Hackett. It should be pointed out that careful analytic studies in a clinical problem such as this are quite difficult. In the first place, a series of controls is particularly questionable since there are hardly any two backs, or back situations, that are identical. Likewise, anatomic variations are enormous. Other factors influencing the validity of results are related to the enthusiasm of the treating physician, the motivations of the patient, compensation factors, dependency of the patient on the physician and our inability to quantitatively measure results from treatment other than by evaluating the patient's subjective symptomatology. It was with a full awareness of these problems that this study was undertaken. It was felt that the validity of Prolotherapy techniques could best be evaluated in patients with chronic back disabilities of prolonged duration, with objective positive findings and in cases representing failure of other conservative measures. The patients selected for study initially had to fulfill the following criteria before they were subjected to this therapeutic regime:

1. Symptoms present for three (3) months, or longer.
2. Symptoms resulting from a specific injury or accident.
3. No evidence of other organic disease, such as rheumatoid spondylitis or other inflammatory lesions which could confuse the issue.
4. No evidence of true intervertebral disk pathology, or neurologic abnormalities. (In the series of a small group of patients with symptoms of true intervertebral disk pathology were tested by this method.)

All of the patients in this series were treated in an identical manner, (using sodium psylliate five (5) per cent with benzyl alcohol two (2) per cent)* with a local anesthetic solution, and in-so-far as it was possible using the same conservative techniques which included bedrest, analgesics and instructions in the care of the back. Eventually, after improvement of symptoms, they were placed on a flexion exercise program. An analysis of these data is presented in table 3.

ANALYSIS OF FORTY-TWO (42) CASES TREATED BY PROLOTHERAPY

Males	=	38
Females	=	4
		42

* * * * * *

Compensation Cases	=	32
Private Cases	=	10

Complete Recovery (3 year follow-up)	Unchanged	Worse . . . Surgery Necessary
20	13	9
		Total = 42

TABLE 3

*Sylnasol (p29), Searle.®

It is immediately apparent that the results in approximately fifty per cent of these cases were observed to be satisfactory. If this percentage seems to be low it should be pointed out that a vast majority of these cases were compensation cases and in this area all authors report lower figures in terms of positive results. Moreover, these cases were truly chronic problem cases and had been subjected to a host of therapeutic techniques prior to the attempts with the sclerosing or proliferating agents. Efforts to more clearly analyze the histology of the tissue response to injection of the sclerosing agent at the fibro-osseous junction have been somewhat unsuccessful so far. On the three occasions when surgical intervention was necessary a distinct effort to obtain a biopsy specimen, at the site of the injection, was made. In each instance no recognizable substance or tissue reaction, different from the ordinary surrounding connective tissue, could be identified. Some general specimens were obtained and when subjected to microscopic study were reported as "fibrous tissue."

One can conclude from an analysis of these data that Prolotherapy frequently may play a useful role in the management of a chronic back problem. These studies only weakly confirm the splendid results reported by Doctor Hackett. Additional time and experience may improve the results somewhat but it is my thinking that Prolotherapy is no panacea, that it should be used with intelligence and discrimination and only in very selected cases. Many times the superior results claimed for Prolotherapy techniques are in acute cases, of short duration, which would have recovered in due time with ordinary conservative measures. It is of interest to note that in the four cases with clinical evidence of herniated intervertebral disk in an acute form, in which the Prolotherapy technique was utilized, primarily as a therapeutic trial and with no hope of success, that all four responded with more outstanding results than any of the other patients in this series. These patients also received the other ordinary conservative treatment measures outlined above, thus, it is illogical to credit Prolotherapy entirely with the observed improvement. Further studies are being continued.

Summary

1. An emphatic plea for a conservative approach and attitude in the management of intervertebral disk problems has been made.

2. A review of the general history and physical findings is presented.

3. Details of the conservative regime of treatment are discussed.

4. Prolotherapy, the technique of Hackett, is reviewed and the data obtained in forty-two cases, utilizing this technique, are presented and conclusions are drawn based on this experience.

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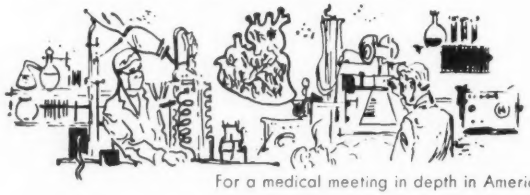

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Heart Page

The Continuing Education of The Physician

STEWART WOLF, M.D.*

No one denies that a career in medical practice requires that the physician be a perpetual student. The problem is how to acquire adequate and appropriate learning over the years. There are three educational resources available to every physician: 1—His day-to-day experience in practice. 2—The medical literature. 3—Medical meetings, including postgraduate courses.

The value of medical practice as a learning experience depends in part on one's sophistication derived from the literature, and from meetings and courses. What seems like limitless expansion of the medical literature, however, has imposed a crushing burden on those who wish to keep up. The result is that many physicians make no attempt to cover the literature and read only irregularly and in a casual fashion. Thus the medical literature is educating to any substantial degree only a small segment of the profession. Similarly, medical meetings and postgraduate courses have a relatively small number of adherents. The very active and education-minded American Academy of General Practice has managed to attract only approximately twenty per cent of general practitioners to its membership.

How can continuing education be brought to more physicians at a time when their need is great, when the practitioner of today is faced with far more complex diagnostic procedures, far more delicate problems of achieving metabolic balance in postoperative patients, and with far more potent and potentially hazardous drugs at his disposal than the practitioner of yesterday ever dreamed of?

The American Heart Association has taken cognizance of this problem, and, through its Professional Education Committee, has inaugurated a program of pilot projects in continuing education which will be tried in various parts of the country and which will be evaluated insofar as possible for their effectiveness in teaching.

The American Heart Association plan grew out of a two-year-long study by the Professional Education Committee of current practices in relation to continuing education. The experience and advice of men in practice, in medical schools, and in the field of education were brought together in a "white paper" entitled: The Physician's Continuing Education.*

The study recognized that the cultivation of a physician's analytical powers, and thus to sharpen his diagnostic acumen and to enrich his clinical judgment, is a far more important objective than bringing him abreast of technical developments in medicine. It was agreed that such an aim would require that the learner-physician be an active participant in the educational procedure and not just a listener. Opportunities must be afforded him to work with actual clinical problems in the course of the teaching program.

One important conclusion of the study was that the widespread lack of interest among practitioners of medicine in postgraduate courses may be related in part to inadequacies in the program being offered. Certainly there is a need for fresh and imaginative approaches to the problem of motivating the physician toward his continuing education and of offering him experiences which warrant his spending time, money and effort away from his patients.

*Professor and Head, Department of Medicine, University of Oklahoma Medical Center, and Chairman of the Professional Education Committee, American Heart Association.

*Write to: The Oklahoma State Heart Association, 825 N.E. 13th Street, Oklahoma City, Oklahoma, for a copy of: The Physician's Continuing Education.

MEDICAL CENTER

Message from the Dean

Several changes have been made this year in the procedure for admission to the School of Medicine. Back of them lies the desire of the Faculty, the Admissions Board and the Administration to select the best possible candidates. It was felt that some capable students have been lost to the school in the past because of a rather inflexible code of grade evaluation and because of the date in starting interviews with prospective candidates.

A student is eligible to enter medical school if he can present a minimum of 90 semester hours of work (exclusive of physical education and military science) from an accredited liberal arts college, and has within those 90 hours at least 34 hours in general chemistry, organic chemistry, physics, biology and English. He must complete his work with a B minus (1.5) average in the prescribed field and also in his overall average, and have at least a C average (1) in each of the prescribed subjects. Previously an F counted as -2. It now counts as -1, making the grading stepwise and bringing it in line with other medical schools.

Although the minimum grade requirement is no different, the new procedure provides that when a student repeats a course in which he made a D or an F, the new grade may be substituted for the D or F for the purpose of calculating an average for possible admission purposes. The change will permit the Admissions Board to consider a student whose work is on the ascendancy and who is working to overcome a poor first year.

Heretofore, applications were accepted from September 1 to November 1. After all applications were in, the students were ranked academically and interviews were started. As many as 30 applicants were processed in any one interview period. Some of the outstanding candidates were being interviewed and accepted by certain other medical schools before we could begin our interviews.

Starting this year, applications will be accepted from July 1 until December 1. They will be processed as they are filed. Interviews will begin in September. Groups of applicants being interviewed will be smaller so that a longer time may be spent with each student.

There are nine members of the Admission Board. The Board is divided into three interview teams, each with three members. When all interviews are finished for any given session, the Board meets as a whole to evaluate each applicant and take action.

Applicants must have successfully completed the Medical College Admissions Test. The premedical advisor's letter of appraisal is also considered. The student may be offered a place in the next year's class, deferred for later consideration, or rejected. Offers for a place in class are contingent upon the student satisfactorily completing all requirements within the time allocated.

Mark R Everett

The Epidemiology of Rheumatic Fever

ROBERT W. QUINN, M.D.*

Prevalence

DISCUSSION of the epidemiology of any disease is more meaningful if the disease in question can be put in its proper perspective as a health problem. Morbidity and mortality rates are most helpful, but it is extremely difficult to obtain accurate data on the incidence or prevalence of rheumatic fever or rheumatic heart disease, because they are not notifiable diseases in all states or countries and even where reporting is "compulsory" only a small percentage of these cases is recorded. This is partly due to negligence of the medical profession and partly due to the difficulty of establishing the diagnosis with accuracy. Probably the best estimates available in the United States of the prevalence of rheumatic fever and rheumatic heart disease, are those based on surveys in which children have been examined for the presence of rheumatic heart disease. Only a few such studies have been conducted in various parts of this country. Table 1 shows the results of some recent surveys in which the prevalence ranges from 0.32 per cent in a residential city in Southern California to 6.0 per cent in some industrial cities in Connecticut. Mortality due to rheumatic fever and rheumatic heart disease has decreased steadily in the past sixty years from one of the foremost causes of death in children to a position behind accidents, malignant neoplasms, congential malformations, infectious diseases including pneumonia and influenza, and nephritis and nephrosis. In this discussion three factors which influence the prevalence and incidence of rheumatic fever will be discussed, namely agent factors, host factors and environmental factors.

Agent Factors

The agent factor for rheumatic fever is not on quite the same footing as for tuberculosis or typhoid fever for example, where everyone agrees that the tubercle bacillus and the typhoid bacillus are the etiologic agents. Nevertheless, there is a great deal of evidence to support the belief that the group A hemolytic streptococcus is the agent factor in this disease. As a matter of fact, one could go so far as to say that rheumatic fever does not occur in the absence of a preceding streptococcal infection and no other bacteria are involved. The evidence for implication of the hemolytic streptococcus is of four kinds, clinical, bacteriologic, serologic and epidemiologic. A diagram constructed from data published by Escherich and Schick[12] in 1912 remains an excellent illustration of the sequence of events (figure 1). The first clinical evidence is a sore

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Presented at the Second Oklahoma Colloquy on Arthritis and Rheumatic Diseases.

Location of Survey	Outstanding Characteristic of Survey Area	References	Date of Survey	Number Examined	Per cent with Rheumatic Heart Disease
Connecticut—Ansonia, Derby, Shelton	Industrial Towns	1	1946-47	754	6.0
Connecticut—Ansonia	Industrial Town	2	1946-47	179	5.02
Montana and Wyoming	North American Indians	4	1936	688	4.50
Connecticut—New Haven, Ansonia, Milford, Meriden	Industrial City and Town	3	1934	918	4.1
Connecticut—Milford	Residential Town	1	1946-47	475	2.5
Wisconsin—Madison	Residential City	5	1950	893	2.2
Connecticut—Hartford, Waterbury, Bridgeport	Industrial Cities	2	1946-47	1,732	2.13
California—Eureka	Seaport	6	1941	2,450	2.04
Colorado—Denver	Rocky Mtn. City	7	1944	1,845	1.63
California—Susanville	Sierra Nevada Mtn. Town	6	1941	732	1.09
Georgia—Dublin	Residential Town	8	1945	401	1.0
Colorado	Rural and Urban	11	1949-51	11,236	0.68
Arizona—Southern	North American Indians	4	1936	1,019	0.50
Florida—Dade County	Residential Area	9	1949	1,001	0.50
Florida—Pensacola	Seaport	10	1949-50	2,600	0.38
California—Redlands	Warm, Dry Residential Area	6	1941	2,635	0.32

TABLE 1
Recent surveys of rheumatic heart disease in school children.

throat with or without a rash, mild or severe. A throat culture at this time will reveal bacteriologic evidence in the presence of hemolytic streptococci in large numbers belonging to serologic group A, either typeable or non-typeable. Most children recover within a few days, or in the case of more severe infection within two or three weeks, without sequellae, and without antibiotics. An unknown small percentage of these infections may result in the symptom complex known as rheumatic fever, occurring from one to three weeks after the onset of the streptococcal infection. Some will have the classical manifestations, easily recognized, others will have symptoms so mild as to go unrecognized. Some of these so-called mild cases may eventually acquire rheumatic heart disease. If blood serum is obtained at the time of the streptococcal infection and again after recovery or after the onset of rheumatic fever, in either case a rise in streptococcal antibodies can be demonstrated by proper serologic tests. This rise constitutes serologic evidence that the throat infection which preceded the onset of rheumatic fever was indeed a streptococcal infection. This antibody increase is shown graphically in figure 1. The epidemiologic evidence for implication of the hemolytic streptococcus is more indirect. During periods of military mobilization rheumatic fever has been a major problem.[13] In the course of the epidemics of streptococcal infections which occurred in most of armed services recruit training centers during World War II there was a simultaneous increase in the incidence of rheumatic fever of epidemic proportions.[14,15,16] Similar increases have been seen after milk-borne epidemics of streptococcal infections and outbreaks in boys schools.

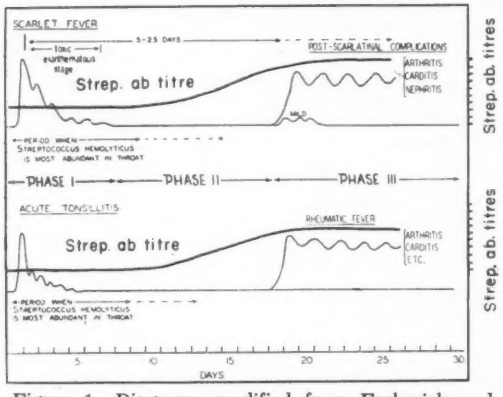

Figure 1. Diagrams modified from Escherich and Schick to illustrate the possible forms (indicated by temperature curves) which the nonsuppurative "complications" of scarlet fever and of acute tonsillitis may assume. The division of this process into three phases is also shown.[12]

Group and type	Streptolysin O	Streptolysin S	Streptokinase	Hyaluronic acid	Hyaluronidase	Proteinase	Erythrogenic toxin	Total
A 1	3	5	3	5	0	1	3	5
A 3	1	1	1	1	0	0	1	1
A 4	2	3	3	3	3	1	1	3
A 5	1	0	1	0	0	0	1	1
A 6	9	9	10	10	0	1	7	10
A 12	12	11	14	14	0	0	12	14
A 19	2	2	2	2	0	1	2	2
A NT	31	44	38	43	7	17	31	49
NG	1	0	0	1	0	0	0	1
Total	62	75	72	79	10	21	58	86

TABLE 2

Relationship of substances produced to group and type. From Hardin, Quinn and Avery.[17]

The biologic characteristics of the hemolytic streptococcus have been studied minutely and exhaustively ever since its first isolation in pure culture by Fehleisen in 1883. Many times these studies have been directed toward the search for the magic and elusive rheumatogenic strain or rheumatogenic substance but today it seems that any strain of group A hemolytic streptococcus has rheumatogenic capabilities but no rheumatogenic substance has been discovered.

The hemolytic streptococcus produces a great variety of antigens, some are extracellular products, others are cellular components. There is a striking difference qualitatively and quantitatively in the enzymes and antigens elaborated by various strains and occasionally by strains of the same type. Table 2 illustrates that strains of identical group and type do not necessarily have identical characteristics when grown in vitro. In contrast, biologic characteristics of streptococci recovered from patients with acute rheumatic fever are very much like those recovered from patients with acute glomerulonephritis, pharyngitis or from chronic carriers,[17] and when these strains are arranged according to the four clinical syndromes with which they were associated, the patterns of enzyme production are similar (table 3). Unexplained are the variations of clinical manifestations which may occur in different patients infected by the same serologic group and type; a mild sore throat in one, a severe sore throat in another, scarlet fever, rheumatic fever or nephritis in still others.

Some of the characteristics of the agent in rheumatic fever are so intimately related to the human host that they must be discussed in this context. Infectivity, the ability to adapt itself to the human body is highly developed and is well demonstrated in carrier studies of normal school children in Nashville, Tennessee.[36] These studies indicate that a high percentage of children carry group A streptococci in their throats during the school year. Figure 2 shows the seasonal and yearly changes in rates over a two-year period. One of the lessons to be learned from this study is that the hemolytic streptococcus is a very common inhabitant of the throats of normal children and that the carrier rates and serologic groups and types change markedly from year to year. In pathogenicity, i.e., the ability of the agent to set up a specific clinical reaction, the hemolytic streptococcus is remarkably versatile; pharyngitis, tonsillitis, scarlet fever,

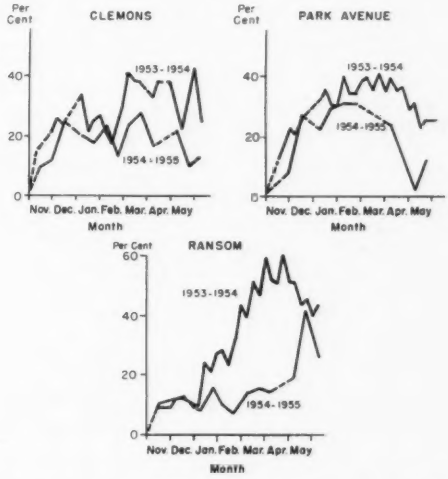

Figure 2. Prevalence of positive throat swabs in children in three Nashville schools 1953-1954 and 1954-1955. From Quinn, Denny and Riley.[36]

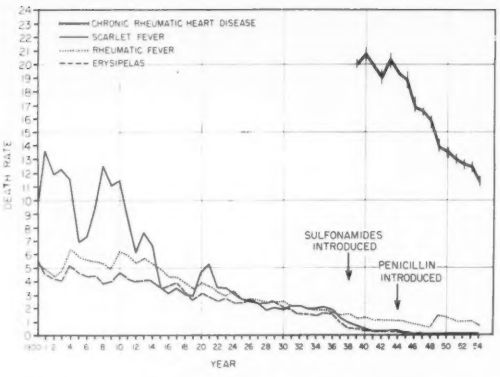

Figure 3. Annual death rates from rheumatic fever, scarlet fever, and erysipelas, 1900-1954 and from chronic rheumatic heart disease 1939-1954, United States.

nephritis, erysipelas and rheumatic fever being among the more common different clinical types of infection. Virulence—a measure of the severity of the reaction produced seems to be an extremely variable characteristic of the hemolytic streptococcus. Not only does it vary from patient to patient but also it changes over the years. It is common clinical experience to see a patient with a mild streptococcal infection and another patient with a severe infection due to the same group and type of streptococcus. In the training centers of the U.S. Navy during World War II where great epidemics were occurring due to types 19, 17 and three, the clinical manifestations in the recruits who were infected ranged from an almost asymptomatic illness to one with severe purulent and non-purulent complications rarely even ending in death. The decreasing mortality rates for some easily recognized streptococcal infections since 1900 (namely scarlet fever, and erysipelas—figure 3) suggest the possibilities that the hemolytic streptococcus is decreasing in virulence, or that the human race in the United States at least, is acquiring greater resistance or perhaps both. The fourth characteristic related to the human host is the antigenic power of the infecting streptococcus. Not many studies are available relating the antigenic characteristics of the homologous hemolytic streptococci to specific antibody responses following streptococcal infections but one study done at the University of Wisconsin[18] does furnish some evidence. In about one-fourth of the patients studied who received no antibiotics, there was no antibody rise to a given streptococcal antigen even though the bacteria elaborated that particular antigen. So, the fact that a particular infecting streptococcus elaborates a specific enzyme does not mean that there will always be a specific antibody response.

The reservoirs and sources of infection of the group A hemolytic streptococcus are usually humans who may have an acute infection or be carriers either convalescent or chronic. There is still the question, whether chronic carriers are sources of infection for other humans, which has not been proven one way or the other. Certainly the large numbers of children who carry group A typeable and non-typeable strains in their throats for many months, constitute a constant reservoir. Occasionally cows may be infected with group A streptococci from humans. Ordinarily bovine mastitis is caused by group B streptococci which are not pathogenic for humans, but if the mastitis happens to be caused by a group A strain, and if the milk is not pasteurized before human consumption, then the stage is set for a serious and explosive milk-borne epidemic of streptococcal infections. Fortunately, due to almost universal pasteurization of milk in the United States and rigid milk ordinances, milk-borne epidemics are few and far between. Occasionally food-borne epidemics occur but these too are uncommon.

Nutrition has not been shown to play a decisive agent role in determining whether a child will acquire rheumatic fever or not. No dietary deficiency has been demonstrated. Naval recruits who acquired rheumatic fever during World War II were receiving optimal diets. The recent report of Coburn on the protective effect of egg yolks in preventing rheumatic fever is very interesting but needs confirmation.[19]

Host Factors

Host factors which influence susceptibility to rheumatic fever are of great variety and variable importance. What it is that makes one child acquire rheumatic fever and another escape, when both have had similar experiences with the same strains of streptococci, both may belong to the same family, or both are of the same age, sex and race

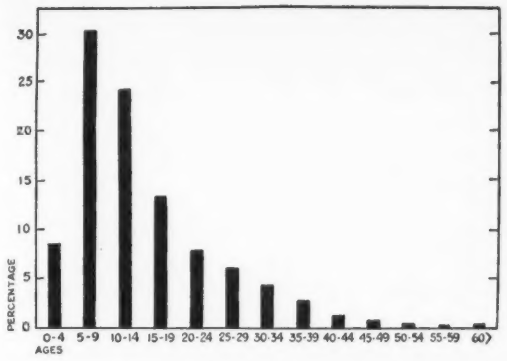

Figure 4. Percentage distribution by 5-year age periods of 2,539 first attacks of rheumatic fever, with or without rheumatic heart disease, based on past or present histories, among cases admitted to Philadelphia hospitals from January 1, 1930, to December 31, 1934. From Hedley.[20]

and are similar in other respects, is a question which is unanswerable at the present time. Nevertheless there are host factors of real importance. All we can do today is observe the effects of these factors and work toward a better explanation of how they operate.

Rheumatic fever rarely occurs before the age of four. It is even quite uncommon before five. From five on, the attack rates increase until they reach a peak between the ages of seven to ten. There is a gradual decrease from then on, so that initial attacks are rarely seen after the age of 20. Figure 4 shows the percentage distribution by five-year age periods of first attacks of rheumatic fever among cases admitted to the Philadelphia hospitals from 1930 through 1934.[20] This figure would probably hold true today although there would be a good deal of argument by some as to whether the patients over 20 were actually experiencing their first attack. The age of onset of 500 cases of rheumatic fever seen at the New Haven Hospital and Dispensary in the early 1930's[21] (figure 5) illustrates even more clearly the ages of peak onset between seven and ten. Among the explanations offered as to why this should be, is that the child needs to have several streptococcal infections before he can acquire hypersensitivity to the streptococcus or its products. Another is that the very young child's antibody forming mechanism can not react in a hypersensitive manner partly because of immaturity and partly because there have been too few stimuli. Paradoxically, adults do not have rheumatic fever nearly as often as children and yet their antibody forming mechanisms must be mature and most of them have had numerous streptococcal infections. However, adults probably do not have as many or as frequent streptococcal infections as children and it may be that frequency of infection plays a role in pathogenesis.

Often the statement is made that rheumatic fever occurs more frequently in the female than the male. Possibly this is because chorea occurs more frequently in girls than boys, and the same reasoning has been applied to rheumatic fever. There is reason to believe that if a large enough number of cases could be accumulated there would be no significant difference in morbidity or mortality for the two sexes. In none of the recent surveys have any significant differences in prevalence by sex been found and it is generally agreed that prevalence is about the same in the two sexes.

Racial characteristics which differentiate one people from another are often sharply defined. Rheumatic fever, however, seems to be common to all races, certainly rheumatic heart disease can be found, if looked for, almost any place on earth. There are marked differences in prevalence among different races but these differences do not seem to be due to any inherent difference in susceptibility. Environmental factors which are peculiar to certain people, such as crowding,

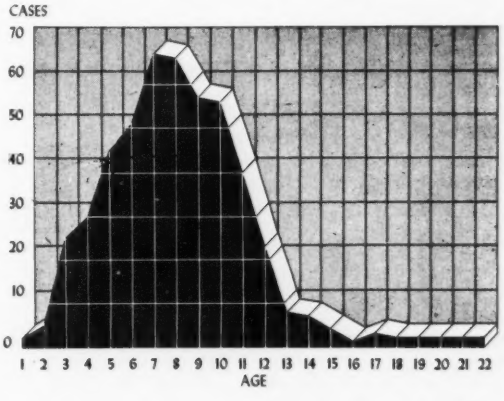

Figure 5. Age at onset of 500 cases of rheumatic fever seen at the New Haven Hospital and Dispensary between 1930-1935. From Leonard.[21]

Substance produced	Nephritics	Rheumatics	Pharyngitis	Carriers	Total
Streptolysin O	21	17	16	7	61
Streptolysin S	19	22	25	10	76
Streptokinase	26	19	20	7	72
Hyaluronic acid	26	22	21	6	75
Hyaluronidase	1	6	3	0	10
Proteinase*	3	9	7	2	21
Erythrogenic toxin†	22	11	14	6	53
Total number of strains in each group that were tested	26	25	25	10	86

*The following strains were not tested for proteinase production: 1 nephritic, 4 rheumatics, and 8 pharyngitis.
†Erythrogenic toxin production was not determined for: 2 rheumatics, 2 pharyngitis, and 1 carrier.

TABLE 3

Enzyme production of strains associated with four clinical syndromes. From Hardin, Quinn and Avery.[17]

geographical location, climate and exposure to the hemolytic streptococcus are all intertwined with the way of life of different races and probably play the key roles in determining prevalence. The Irish, Italians and Jews have all been singled out as being particularly susceptible to rheumatic fever at one time or another, but as Paul[22] points out, these impressions may have been the result of studies which measured the frequency with which certain races used a particular hospital where the data were collected.

The general health status of rheumatic and non-rheumatic children does not seem to differ in any important respects previous to the onset of rheumatic fever. The general impression one might get from seeing rheumatic children in convalescent homes and pediatric clinics is that many of these children, perhaps close to half of them, are substandard in general health characteristics such as nutrition, growth and dental hygiene. These defects are more likely a reflection of the socio-economic background of the child rather than some inherent defect in make-up. An equal number of non-rheumatic children from similar socio-economic classes would probably show the same deficiencies in about the same proportion. Perhaps because rheumatic fever rates are highest in the lower socio-economic groups this environmental characteristic has too often been interpreted as a host characteristic.

The observation that parents and close relatives of rheumatic children have a higher prevalence of rheumatic fever than the general population or than non-rheumatic families, is an old one[23,24,25,26] which has led to the assumption of a hereditary factor[27,28,29] in the etiology of rheumatic fever. The high familial prevalence of rheumatic fever is generally accepted but whether this is due to the effects of heredity or to the combined effects of agent and environment is controversial. Wilson and her colleagues,[30,31] applying genetic methods to the study of rheumatic families have concluded that heredity and not environment is responsible for the high familial prevalence of rheumatic fever. Gray et al,[32] adapting the genetic criteria of Wilson to the study of a group of rheumatic families in New Haven, Connecticut, found that the observed number of cases of rheu-

HEREDITY IN RHEUMATIC FAMILIES

	No. of Families	Total No. Children (Second Generation)	Rheumatic Children Predicted*	Rheumatic Children Observed	
				No.	%
Neither parent rheumatic	31	168	55	59	35.1
One parent rheumatic	6	29	15	16	55.2
Both parents rheumatic	3	9	9	6	66.7

*Predicted on basis of single autosomal recessive gene with correction for family size and bias in selection of families.

TABLE 4

Predicted and observed cases of rheumatic fever in rheumatic families. From Gray, Quinn and Quinn.[32]

matic fever which occurred in these families approximated very closely the number predicted on the basis of a single autosomal recessive gene, except in the mating of two rheumatic parents (table 4). These findings and those of Wilson are very impressive when considered in relation to these particular studies but when applied to the findings of other surveys and of everyday clinical experience, unless resort is made to the genetic term "penetrance," the genetic formula fails to explain the occurrence of rheumatic fever in individuals in whom there is no family history of rheumatic fever. The study of Gray et al indicated in addition, that socio-economic and other environmental factors played a strong role in the occurrence of rheumatic fever in both rheumatic and non-rheumatic families. The age old question of heredity vs. environment has not been settled in the case of rheumatic fever, but until we have good evidence to the contrary it seems best to work along the lines that both hereditary and environmental factors are important among the causative factors. Man is a victim of both his genes and his environment.

Environmental Factors

Environmental factors, which along with host and agent factors exert such a profound effect on the lives of men can be discussed logically under physical and socio-economic influences although both are interrelated. Two features of man's physical environment which seem to be important in determining prevalence of rheumatic fever are geographic and climatic which are also intimately related. Both rheumatic fever and rheumatic heart disease are observed much more frequently in the temperate zones of the earth than in regions further north or south. Admittedly there have been no attempts to measure the prevalence of these diseases in arctic regions and only a few in tropical regions, which reveal the presence of rheumatic heart disease in relatively low numbers. Surveys done in the United States over the past 20 or 30 years have in general shown declining prevalence rates from northern to southern latitudes. However, if surveys could be made in each of the major geographic and climatologic areas of the United States, simultaneously, using the same diagnostic criteria, a much more accurate picture could be obtained. A recent survey done in Nashville, Tennessee indicates that rheumatic fever and rheumatic heart disease are as common as any place in the United States at this time. Possibly at one time the differences in rates attributed to latitude and climate were much greater than at present. One will have to go much further south than Nashville to get out of the "rheumatic fever belt," even further south than Miami, Florida, because Saslaw[9] has found the rate of rheumatic heart disease among native Floridians to be about the same as that reported by Maresh and colleagues[11] in Colorado.

A useful way to evaluate the effect of climate on a disease is to consider climate to be of two kinds, macro and micro. These terms, attributed many years ago to Danisvewsky of Moscow, Russia, have been put to practical use by Paul in the United States. In evaluating the effects of climate on host and agent both must be considered. Macroclimate implies climate in the meteorologic sense: rainfall, temperature, humidity, barometric pressure, seasons, solar effects, etc. It has been agreed for a long time that those temperate zones which have the longest winters, with lowest mean temperature also have the highest rheumatic fever rates. A macro-climate of this type also has an indirect effect in that it tends to keep people indoors, thereby creating a micro-climate which would favor the spread of pathogens including the hemolytic streptococcus. Micro-climate refers to man's immediate environment: the home, the classroom, the movie theatre, the school bus. One of the characteristics of man's environment about which there is much hearsay but few facts is dampness. If one defines dampness arbitrarily as high relative humidity, then it is probably always damp in the tropics or at sea and yet the occurrence of rheumatic fever in these two places is very low so there must be other factors than dampness per se which help influence rates. The effect of dampness on the agent takes on greater meaning when viewed in the light of Well's work in aerobiology.[33] He showed that micro-organisms, including the hemolytic streptococcus, suspended in humid air could survive ultra violet irradiation much longer

than when in dry air. One wonders about the role of this phenomenon in determining why streptococcal infections and rheumatic fever occur most frequently in the late winter and early spring months when it is cold and damp and ultra violet effects are minimal.

The socio-economic influences of man's environment exert a powerful effect on the prevalence of health and disease. These effects are complex, subtle and numerous. They are difficult to measure and the results of measurement of socio-economic effects are not always clear-cut probably because they are so interrelated and almost impossible to isolate. Rheumatic fever has often been called a disease of crowds because the highest prevalence was observed in areas of greatest population density, i.e., in urban rather than rural areas, in large cities rather than small cities or towns, and finally in the sections of cities with the most crowding. The overall effect of crowding seems paradoxical if viewed in the light of world population. Population density today is the greatest in the history of man. In the United States our population has more than doubled since 1900 but mortality rates due to rheumatic fever in 1954 were less than a quarter as high as those in 1900 (figure 3). We have no way of knowing whether morbidity rates have decreased to the same extent but never in the history of man have so many people been jammed into such small spaces. If crowding per se determined the rates of rheumatic fever, we would expect the prevalence to have increased but the opposite has happened. Obviously, there are other factors than just crowding which influence prevalence but its effect should not be minimized because even as recently as 1946-47 a study in Connecticut showed that significantly more children living in crowded homes were rheumatic regardless of the urban or rural location of the home,[34] so that today, we are faced with a confusing set of observations in which crowding at the community level does not affect the morbidity rates but crowding at the household level does. Almost without exception crowding in the home is found in homes of those belonging to the lower socio-economic levels. Crowding and poverty usually go together so that all of the attributes of poverty such as poor nutrition, poor environmental sanitation, low income, low educational level, and possibly also lower intelligence levels are all part of the many influences under the heading of socio-economic which help determine morbidity and mortality rates. A study in New Haven, Connecticut showed "that the mortality rates due to rheumatic heart disease during the years 1920-1948 have been consistently higher in the poorest living area than in the middle or best strata.[35] These findings are consistent with the concept that rheumatic fever rates are usually highest in an environment where crowding is most prevalent, and housing and socio-economic status the lowest. It would seem that in New Haven, Connecticut continued residence in the poorest living areas after the onset of rheumatic fever would carry a greater risk of mortality due to rheumatic heart disease than continued living in the two better ecological areas." It is always risky to apply impressions gained from one area to another at a different time and place but these findings could possibly apply to many cities in the United States today.

Summary

Multiple influences are at work in the etiology and pathogenesis of rheumatic fever. These influences can be listed under the heading of agent, host and environmental factors but in reality they are all intimately interrelated and inseparable. Today there is general agreement that the agent factor is the hemolytic streptococcus belonging to serologic group A but just how the streptococcus initiates rheumatic fever is not known. There undoubtedly are host factors which make certain individuals more susceptible than others and determine which child will acquire rheumatic fever, but it is not at all clear what these are. Age is one host factor of importance, rheumatic fever rarely occurring for the first time before the age of four or after the age of 20. There is a high prevalence in certain families thought by some to be due to hereditary predisposition, but this is not always consistent and environmental factors interfere to confuse the picture. The individual's experience with the hemolytic streptococcus undoubtedly plays a very important role, but this too is influenced by environment. Among the

environmental characteristics which play an indirect but important role in setting the stage for rheumatic fever and also higher prevalence and incidence rates are high population density, crowding in the homes, and low socio-economic status.

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Some Immunologic Aspects of Rheumatic Fever

ROBERT W. QUINN, M.D.

Introduction and Definition

ALMOST three decades ago Schlesinger[1] and Sheldon[2] in England and Coburn[3] in this country revived interest in hemolytic streptococcal infections as the percursor of initial attacks and recurrences of rheumatic fever. Since then a vast amount of work has been directed at this organism in an effort to establish it as the agent factor in rheumatic fever and toward the immunologic response of the host to infection by the hemolytic streptococcus. Few of these studies, of which only a small number are referred to here, truly have been concerned with immunity, most of them have dealt with measurements of antibody response to various streptococcal products or components. These antibodies, with one exception, antibodies against the type-specific M protein, have little or nothing to do with immunity to the hemolytic streptococcus. Indeed, there is no conclusive evidence at the moment of the role streptococcal antigens or antibodies against them might play in the etiology of rheumatic fever. The phenomenon of hypersensitivity has long been thought to play a role in the pathogenesis of rheumatic fever. If, for the sake of this discussion, we assume there might be some altered reactivity of rheumatic individuals to products or components of the hemolytic streptococcus or to other non-streptococcal antigens, then it ought to be possible to measure these differences quantitatively. It is the purpose of this paper to discuss some recent studies which have attempted to single out differences in the manner in which rheumatic individuals, i.e., those with rheumatic fever or rheumatic heart disease, respond to antigenic stimuli.

On the basis of numerous investigations, it has become well-established that individuals who acquire rheumatic fever after a streptococcal infection, have higher streptococcal antibody titres than those individuals who recover without acquiring rheumatic fever.[4,5,6,7,8,9,10] There is always some overlapping, but if rheumatics are considered as a group this observation seems to hold true. Figures 1, 2 and 3 illustrate the comparative response of patients following streptococcal infections for three streptococcal antibodies, antistreptokinase,[9] antihyaluronidase,[11] antistreptolysin "O".[12] For each of these three antibodies the frequency distribution and mean titres for patients with acute rheumatic fever were at a considerably higher level than for patients convalescent from streptococcal infections who did not acquire rheumatic fever. When these differences are analyzed they prove to be statistically significant. These findings might lead one to conclude that rheumatic subjects develop higher levels of streptococcal antibodies because they are funda-

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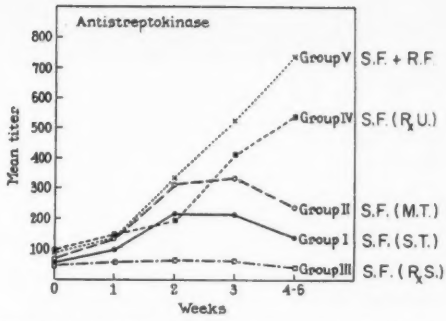


Figure 1. Antistreptokinase response in patients infected with group A hemolytic streptococci. From Anderson, Kunkel and McCarty.[9]

S.F. (℞ S.)—Scarlet fever, treatment satisfactory.
S.F. (S.T.)—Scarlet fever, single type of streptococcus.
S.F. (M.T.)—Scarlet fever, multiple types of streptococci.
S.F. (℞ U.)—Scarlet fever, treatment unsatisfactory.
S.F. + R.F.—Scarlet fever followed by rheumatic fever.

mentally different. However, such a conclusion is open to a number of criticisms, one of which is that the elapsed time since the most recent streptococcal infection may be quite different in the two groups. If the rheumatics had experienced more numerous or more recent streptococcal infections than the non-rheumatics of comparable ages the question is, "would they be more likely to respond with a higher titre than those who had less numerous or less recent infections?" Another objection is that the dose of antigen in a streptococcal infection is unknown and uncontrollable and it could be that some patients have higher antibody titres because they received a larger dose of antigen during the infection. However, if the individuals who contract rheumatic fever have reacted in a hypersensitive manner to an antigenic stimulus provided by the hemolytic streptococcus is it conceivable that they might also react in an abnormal manner to any antigenic stimulus?

With this question in mind, several investigators have administered antigens to rheumatic and non-rheumatic subjects and measured quantitatively the antibody response. In the first of these studies[13] the antigens employed were type I pneumococcal polysaccharide and BCG vaccine. Table I illustrates that the quantitative precipitating antibody response to type 1 pneumococcal polysaccharide was not significantly different in the two groups and table 2 shows that sensitivity to old tuberculin following BCG immunization was not significantly different. In the next study by Miller, Kibrick and Massell[14] the antigens used were influenza virus vaccine, containing influenza PR 8 and influenz B Lee strains, and monovalent typhoid vaccine. There were no significant differences between the rheumatics and controls in antihemagglutinins or complement fixing antibodies against strain PR 8 and B Lee. Likewise, there were no significant differences in response to typhoid "H" or "O" antigens. The only study of this type which has shown clear-cut higher response of rheumatics compared with non-rheumatics was one by Padovcova and his colleagues.[15] In figure 4 the results of this study in which the subjects were given a single dose of Brucella antigen are shown. Until this latter study, it seemed clear that rheumatics as a group do not react differ-

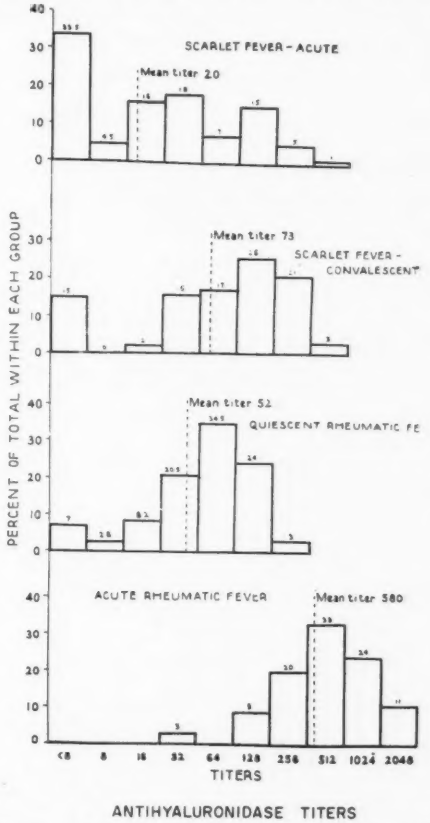


Figure 2. Mean Antihyaluronidase titres in patients with scarlet fever, acute; scarlet fever, convalescent; quiescent rheumatic fever and acute rheumatic fever. From Harris and Harris.[8]

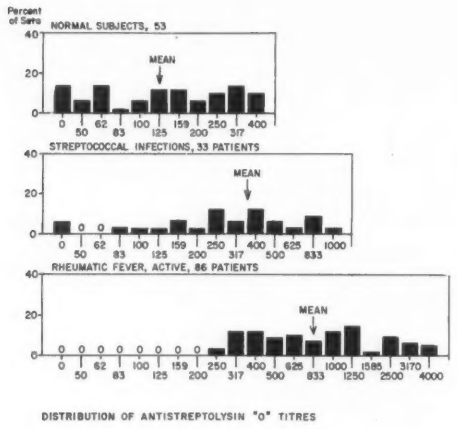


Figure 3. Frequency distribution and mean Antistreptolysin "O" titres in normal subjects, patients convalescent from streptococcal infections and patients with active rheumatic fever. From Quinn and Liao.[12]

ently than non-rheumatics to non-streptococcal antigens. Although not quite so clear now, further studies may help untangle the confusion.

Antibody response one month after 0.05 mg Pn I SSS

RHEUMATIC FEVER		NON-RHEUMATIC		RHEUMATIC HEART DIS.		NON-RHEUMATIC	
Age	Ab glob*	Age	Ab glob	Age	Ab glob	Age	Ab glob
14	.38	10	.59	28	1.12	23	1.33
12	.27	13	.57	23	0.52	21	1.31
11†	.23	9	.55	29	0.50	43	0.31
11	.23	6	.36	28	0.38	26	0.24
6†	.18	8	.27	31	0.25	25	0.18
14	.18	11	.20	22	0.20	21	0.17
13	.16	17	.18	20	0.06	22	0.13
9	.15	14	.12	20	0.02	26	0.12
18	.13	12	.12			27	0.09
5	.13					26	0.09
7	.12					38	0.07
						22	0.07
						21	0.07
Averages							
11	0.20	11	0.33	25	0.38	26	0.32

*Ab glob = mg anti PnI *gamma* globulin per 4 ml serum. Pre-immunization level subtracted from post.

Table 1

Quantitative precipitating antibody response to type I pneumococcal polysaccharide. From Quinn, Seastone, and Dickie.[13]

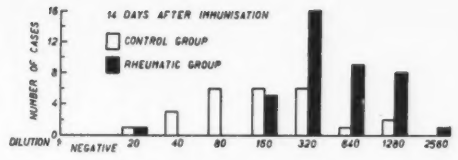
Relationship of rheumatic history and sensitization to tuberculin by BCG

	Rheumatic Heart Disease or Inactive Rheumatic Fever*				No History of Rheumatic Fever			
Time after BCG	2 weeks		1 month		2 weeks		1 month	
Tuberculin (OT)	1.0 mg		0.01		1.0		0.01	
Test read in hours	24	48	24	48	24	48	24	48
Av. diam of induration (mm)	Number of persons in each reaction-category							
0	1	7	1	3	4	17	1	4
5	4	1	0	3	3	0	1	9
10	2	2	4	2	3	1	5	4
13	1	0	2	0	0	2	4	1
15	0	0	1	1	1	1	5	1
20	5	1	4	3	7	0	2	0
25+	1	1	1	1	3	0	2	2
Total number of persons	14	12	13	13	21	21	20	21

Table 2

Sensitivity to old tuberculin following BCG immunization. From Quinn, Seastone, and Dickie.[13]

Antigenic stimuli like these just described are not really analogous to what happens in streptococcal infections and rheumatic fever where probably all school children have had at least one and possibly several previous streptococcal infections. In the previous experiments, the antigens used were some to which the individual had not been exposed previously. It seemed logical then to use antigens to which the individual had been previously exposed, then the administration of the antigen would be in the nature of a booster dose, a situation which is similar to what happens in repeated streptococcal infections. The work of Kuhns and Pappenheimer[16] suggested another antigen-antibody system in studying this problem. This system was employed by Kuhns and McCarty[17] and by Quinn.[18] Essentially the method consisted of administering diphtheria toxoid to Schick-negative rheumatic and non-rheumatic individuals and measuring the antibody response quantitatively. The findings of these two investigations were essentially the same, namely that children and young adults with rheumatic fever did not respond to a booster dose of diphtheria toxoid in a manner which was significantly different from non-rheumatics when increase in cir-



Agglutinin Response to Brucella Antigen

Figure 4. Agglutinin response to Brucella Antigen. From Padovcova, Rejholec, Suda and Wagner.[15]

culating diphtheria antitoxin is the criterion of response. Tables 3 and 4 demonstrate the findings in the latter of these two studies. Kuhns and McCarty suggested also that the production of non-precipitating, skin-sensitizing antibodies was not essentially different in rheumatics and non-rheumatics. Although the study by Quinn showed no significant production of non-precipitating, skin sensitizing antibodies by either group of subjects, these two investigations certainly suggest that rheumatics do not respond to a booster dose of diphtheria toxoid in a manner different than non-rheumatics. It is tempting to suggest also that rheumatics would not respond any differently than non-rheumatics to any non-streptococcal antigen when it is administered in the form of a booster, but there is no evidence that this is so. All that one can say is that when booster doses of such commonly used vac-

RHEUMATIC SUBJECTS

No.	Name	Age	Sex	Diagnosis	Pre-Booster Antitoxin Titre in Units Per Ml.	Post-Booster Antitoxin Titre in Units Per Ml.	Post-Booster Units of Pptn. Antitoxin Per Ml.	Ratio of in vivo to Pptn. titres	Diphtheria Toxin Remaining After pptn.	Dilution of Serum required to fix 2 full units complement
1	S.E.	11	F	R.H.D.-A.	< 0.1	<1	0.9	about 1	+	Q.N.S.
2	L.M.	12	F	R.F.-A.	< 0.1	2	0.3	7	0	No C.F.
3	M.B.	16	F	R.H.D.-I.	< 0.1	3	0.8	4	0	? 1:10
4	P.L.	5	F	R.F.-A.	< 0.1	5	2.2	2.3	0	Anti C.
5	T.P.	9	F	R.F.-A.	0.1-1.0	8	1.4	6	4	No C.F.
6	G.R.	14	M	R.F.-I.	< 0.1	8	3.8	2.1	+	1:5
7	A.B.	15	M	R.F.-I.	< 0.1	8	1.8	4	0	No C.F.
8	S.C.	8	F	R.F.-A.	0.1-1.0	15	4.8	3.1	0	1:5
9	P.D.	13	M	R.H.D.-I.	< 0.1	15	2.2	7	+	1:5
10	P.L.	6	F	R.H.D.-A.	1-5	15	6.7	2.2	0	Anti C.
11	A.B.	8	F	R.F.-A.	1-5	25	10.2	2.5	0	Anti C.
12	H.P.	14	F	R.H.D.-I.	< 0.1	40	21.8	1.8	?	Q.N.S.
13	H.D.	9	F	R.H.D.-A.	< 0.1	50	8	6	0	1:5
14	W.B.	15	F	R.H.D.-A.	< 0.1	55	4.5	12	+	Anti C.
15	R.A.	11	F	R.F.-A.	< 0.1	55	6.4	9	0	1:10
16	G.B.	8	F	R.F.-A.	0.1-1.0	55	20	2.8	0	1:20
17	C.E.	22	M	R.F.-A.	0.1-1.0	55	34	1.6	0	1:20
18	E.D.	14	M	R.H.D.-A.	0.1-1.0	65	1.0	65	+	No C.F.
19	S.C.	12	M	R.H.D.-A.	0.1-1.0	125	62.8	2	0	1:160
		Ave. 11.1				Ave. 32 Med. 15	Ave. 10.2 Med. 4.5	Ave. 3.1		

R.F.—Rheumatic Fever
R.H.D.—Rheumatic Heart Disease
I.—Inactive
A.—Active
Q.N.S.—Quantity Not Sufficient
No C.F.—No Complement Fixation
Anti C.—Anti Complementary
Pptn.—Precipitating

Table 3
Diphtheria antitoxin response to diphtheria toxoid in Rheumatic Subjects. From Quinn.[18]

NON-RHEUMATIC SUBJECTS

No.	Name	Age	Sex	Diagnosis	Pre-Booster Antitoxin Titre in Units Per. Ml.	Post-Booster Antitoxin Titre in Units Per. Ml.	Post-Booster Units of Pptn. Antitoxin Per Ml.	Ratio of in vivo to Pptn. titres	Diphtheria Toxin Remaining After pptn.	Dilution of Serum required to fix 2 full units of complement
1	S.S.	16	M	N.R.	< 0.1	< 1	1.3	about 1	+	Anti C.
2	S.J.	10	M	N.R.	< 0.1	< 1	0.6	0.6	0	No C.F.
3	G.S.	15	F	N.R.	0.1-1.0	4	3.5	1.1	0	No C.F.
4	W.P.	10	F	N.R.	0.1-1.0	5	1.7	2.9	0	Q.N.S.
5	H.E.	10	M	N.R.	1-5	8	1.0	8	0	Q.N.S.
6	B.B.	15	F	N.R.	< 0.1	8	4.1	2	0	1:5
7	W.C.	14	M	N.R.	0.1-1.0	10	1.3	8	0	Anti C.
8	P.B.	11	M	N.R.	< 0.1	10	0.8	12	0	Anti C.
9	H.G.	17	F	N.R.	< 0.1	10	2.0	5	0	Q.N.S.
10	H.H.	8	M	N.R.	≈ 0.1	15	6.1	2.5	+	1:10
11	D.W.	6	M	N.R.	0.1-1.0	15	0.6	25	0	No C.F.
12	A.C.	15	M	N.R.	< 0.1	15	1.5	10	0	Anti C.
13	M.D.	15	F	N.R.	0.1-1.0	25	12	2.1	0	1:10
14	W.R.	11	M	N.R.	< 0.1	30	13.2	2.3	?	Q.N.S.
15	R.C.	10	M	N.R.	< 0.1	45	18.5	2.4	0	1:10
16	W.C.	8	F	N.R.	< 0.1	55	19.6	2.8	0	1:10
17	P.W.	15	M	N.R.	< 0.1	55	16.5	3.3	+	1:20
18	B.D.	14	M	N.R.	< 0.1	55	23.6	2.3	0	1:160
		Ave. 12.2				Ave. 20 Med. 12.5	Ave. 7.1 Med. 2.75	Ave. 2.8		

N.R.—Non-Rheumatic

Q.N.S.—Quantity Not Sufficient
No C.F.—No Complement Fixation
Anti C.—Anti Complementary
Pptn.—Precipitating

Table 4

Diphtheria antitoxin response to diphtheria toxoid in non-rheumatic subjects. From Quinn.[18]

cines as typhoid, tetanus, smallpox or poliomyelitis are administered, clinical experience would leave one with the impression that rheumatics do not react any differently than those who have never had rheumatic fever.

Perhaps it is futile to argue this point because one can not escape the question "what do bacteria other than the hemolytic streptococcus or viruses or non-streptococcal antigens have to do with rheumatic fever anyway?" The answer today would have to be —"They have nothing to do with rheumatic fever." The crucial question would seem to be: "do rheumatics respond differently to streptococcal infections or antigens than non-rheumatics?" Earlier in this paper several references were cited all of which agreed that the rheumatics as a group do respond with higher antibody titres than do those recovering from streptococcal infections without getting rheumatic fever. Some of the objections to accepting these findings as evidence of a fundamental difference in rheumatics were also discussed. At the present time it is not possible to know in retrospect how many previous streptococcal infections any given individual has had nor is it often possible to tell when he had his most recent infection, but the results of Rantz and his colleagues[19] and others certainly make it clear that children have numerous streptococcal infections. These factors of course would influence antibody response.

Fortunately, it is possible to challenge individuals with streptococcal antigens and thereby eliminate the criticism of unequal doses of antigen. Whole streptococci have been administered in various kinds of vaccine in the past and for awhile immunization against scarlet fever was popular but no quantitative measurements of antibodies seem to have been made following their administration so that there has been no information on which to form an answer to this crucial question. However, a recent investigation has attempted an answer to the question of whether rheumatic individuals respond to streptococcal antigens in a different manner than non-rheumatic individuals.[20] In this experiment doses of streptolysin "O" concentrate were administered intramuscularly to a group of children with rheumatic fever and a group of non-rheumatic children. Antistreptolysin "O" titres were determined at three weeks. The results shown in figure 5 although not striking in the bar graph, when analyzed indicate that the children with rheumatic fever responded as a group with significantly higher antistreptolysin "O" titre rises than non-rheumatic children following equivalent doses of streptolysin "O". These findings although suggestive would be of greater significance if all of the rheumatic children and none of the non-rheumatic children had reacted in this manner, but perhaps this is too much to expect. If rheumatic subjects are all fundamentally different in the manner in which they respond to streptococcal infections or antigens it might be expected that all or nearly all of them would exhibit higher antibody rises. There was another result of this experiment with an even more significant difference. Six of 20 of the rheumatic children exhibited a marked local and systemic reaction to the streptolysin "O" concentrate whereas only one of 55 non-rheumatic children showed this kind of response. The meaning or the cause of these differences are not clear but the explanation does not necessarily lie in any fundamental difference in the manner in which rheumatic children respond to streptococcal antigens. The response will certainly be influenced by the individual's past experience with the hemolytic streptococcus, especially the number and frequency of infections, possibly

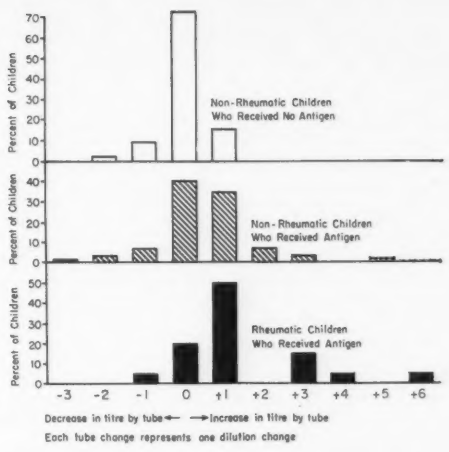

Percent of Children
Non-Rheumatic Children
Who Received No Antigen
Non-Rheumatic Children
Who Received Antigen
Rheumatic Children
Who Received Antigen
-3 -2 -1 0 +1 +2 +3 +4 +5 +6
Decrease in titre by tube
Increase in titre by tube
Each tube change represents one dilution change

Figure 5. Percentage distribution of rise, no change and decrease in antistreptolysin "O" titres in rheumatic and non-rheumatic children three weeks following the injection of antistreptolysin "O" concentrate. From Quinn.[20]

also severity of the infection and nowadays the kind of treatment received. The information about past streptococcal infections necessary to make a complete evaluation of this experiment is not available nor would it be available for any study of this kind done in retrospect. However, the results do support previous clinical observations that rheumatic children frequently, but not always, respond with higher antibody levels following a hemolytic streptococcal infection than do non-rheumatic children.

Now, where does all this leave us? Well, we must admit that today no so-called "rheumatogenic substance" of the hemolytic streptococcus has been shown to exist and no clear-cut fundamental difference in host response to streptococcal or non-streptococcal antigens has been demonstrated. Perhaps we have been measuring the wrong kind of host response or the wrong kind of antibody or the wrong characteristic of the hemolytic streptococcus. Is there any way out of the present state of confusion? Yes, there probably is but it will require the application of different immunologic theories and techniques and painstaking careful epidemiologic studies of the horizontal, ongoing type rather than the kind which is done in retrospect or is concerned only with the present.

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Vanderbilt University School of Medicine, Nashville, Tennessee

Annual Fall

Alpha Omega Alpha

Lecture

October 11, 1961 **4:00 p.m.**

Auditorium

University of Oklahoma School of Medicine

800 N.E. 13th Street

Guest Lecturer

John Caffey, M.D., pediatric radiologist,

Denver, Colorado

ABSTRACTS

Mechanism of Immune Lysis of Ehrlich Ascites Tumor Cells

ANTON LINDER*

American Journal of Clinical Pathology 34: 426-433, November 1960

Mice bearing Ehrlich ascites tumor were treated with immune gamma globulin and guinea pig complement on the fourth, fifth, and sixth days after tumor transplantation. Tumor growth was inhibited as a result of the cytotoxic action of antibody and complement. Lysis was observed in approximately 70 per cent of the tumor cells, which were also conspicuously enlarged and swollen. These cells revealed the space between the nucleus and the cell membrane to be widened, but empty of basophilic material (RNA), which apparently had permeated the cell membrane, and was observed attached to the outside of the cell, appearing as a fringe of darkly staining basophilic material. This same pattern was observed when the cells were stained for protein.

Fluorescent staining with labeled immune gamma globulin revealed fluorescence at the site of the cell membrane, suggesting antigen-antibody reaction at the cell surface.

*Associate Professor of Pathology and Director Cytology Laboratory, University Hospital.

Response to Cortisone Predibetes Glucose- and Steroid-Glucose Tolerance in Subjects Whose Parents Are Both Diabetic

KELLY M. WEST*

Diabetes, 9: 379-385, Sept.-Oct., 1960

Subjects whose parents were both diabetic were studied with respect to glucose tolerance and cortisone-glucose tolerance. The status of glucose tolerance was known or tested in forty-six of these individuals whose ages averaged thirty-seven years.

In fourteen (29 per cent) glucose tolerance was impaired. These data were compatible with the notion that the incidence of genetic susceptibility to diabetes in this group approaches 100 per cent.

Cortisone-glucose tolerance tests were performed in twenty-six persons with normal glucose tolerance whose parents were both diabetic. Their responses to cortisone were not significantly different from those of a control group with normal glucose tolerance and no family history of diabetes. Seven other subjects whose parents were both diabetics were not tested after glucose alone, but had steroid-glucose tolerance tests. Four had cortisone-glucose tolerance tests and three had prednisone-glucose tolerance tests. The results of all seven tests were normal.

Cortisone-glucose tolerance tests were performed in twenty-six subjects with slight impairment of glucose tolerance. Their responses to cortisone were normal.

These findings suggest that individuals with prediabetes are not unusually responsive to the hyperglycemic effects of cortisone when it is administered by the technic of Fajans and Conn.

*Assistant Professor of Medicine.

Symmetric Peripheral Gangrene In Pneumococcal Sepsis

RICHARD E. BETTIGOLE*

Annals of Internal Medicine, 54: 335-342, Feb. 1961

A case of symmetric perpheral gangrene complicating pneumococcal pneumonia and meningitis is presented, and the theory is proposed that this phenomenon may be due to a fortuitous combination of many predisposing factors, including extreme dehydration and previous cold injury. Possible means of attempting to avoid this condition and of treating it are discussed.

*Resident in Department of Medicine, University Hospital.

Disease As a Way of Life: Neural Integration in Systemic Pathology

STEWART WOLF*

Perspectives in Biology and Medicine 4: 288-305, 1961

*Professor of Medicine, Consultant Professor of Psychiatry, Neurology, and Behavioral Sciences.

Utilization of Serum a_1-Globulin and Glycoprotein by Diplococcus Pneumoniae

YU-TEH LI* and M. R. SHETLAR**

Proc. Soc. Exptl. Biol. Med. 106: 398-400, 1961

When serum samples were incubated with a rapidly growing strain of **Diplococcus pneumoniae,** striking decreases of serum glycoprotein and consistent decreases of protein resulted. Paper electrophoretic studies indicated that these changes were largely restricted to the a_1-globulin fraction. It would appear that this strain of **Diplococcus pneumoniae** preferentially uses glycoproteins found in the a_1-globulin fraction of mammalian serum.

*Graduate Student, Department of Biochemistry.
**Professor of Biochemistry.

Estimation of Coronary Blood Flow by an Externally Placed Scintillation Detector

GUNNAR SEVELIUS* and PHILIP C. JOHNSON**

Proc. Okla. Conference Radioisotopes in Agriculture **TID-7578:** 269-274, 1960

A new method for measuring coronary blood flow has been developed. This method makes use of a scintillation detector of monitors on the chest wall and the time dilution curve of radioactivity during its first passage through the heart chambers and through the myocardium. The values obtained compare favorably with the values obtained by standard methods and in a flow model. Significant differences have been found between patients with and without myocardial infarctions.

*Research Fellow in Medicine.
**Radioisotope Laboratory, Methodist Hospital, Houston, Texas.

Defective Synthesis of Triglyceride Fatty Acids from 1-C-14 Acetate in the Well-Controlled Stable Adult Diabetic

ALLEN R. HENNES* and TOMMY W. REDDING**

Diabetes, 10: 85-89, March-April 1961

The synthesis of plasma lipids from I-C-14 acetate has been studied in nondiabetic subjects and in diabetics controlled with long-acting insulin. Lipids were fractionated on silicic acid columns.

1. No diabetic was found to synthesize more than normal amounts of plasma-free cholesterol from I-C-14 acetate. In fact, two of the five diabetics synthesized less than normal amounts of plasma-free cholesterol.

2. All diabetics showed a striking decrease in synthesis of plasma triglyceride fatty acids.

3. These abnormalities occur despite a normal fasting blood sugar.

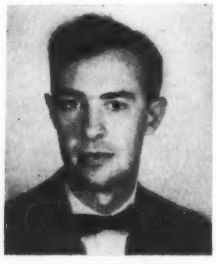
4. The presence of a normal fasting blood sugar and normal plasma lipid levels does not indicate that the lipid metabolism of the diabetic is normal.

*Assistant Professor in Medicine.
**Biochemist, Laboratories, Veterans Administration Hospital, Oklahoma City.

Chairmen of Three Basic Science Departments Named

Three new chairmen of basic science departments will assume duties at the School of Medicine this summer and fall.

Marion deVeaux Cotten, Ph.D., formerly of Emory University School of Medicine, is newly-appointed professor and chairman of Pharmacology.



COTTEN

Francis J. Haddy, M.D., Ph.D., of Northwestern University, came to the school September 1 as professor and chairman of Physiology, and associate professor of medicine.

In the Department of Microbiology, L. Vernon Scott, D.Sc., professor and a faculty member since 1950, succeeded Martin M. Cummings, M.D., as chairman when the latter left July 1 to become chief of the National Institutes of Health's new office of International Research.

Doctor Cotten has been an associate professor in the departments of pharmacology and physiology at Emory since 1957. He received his Ph.D. from the Medical College of South Carolina in 1952, remained there two years as a research associate, later taught at Tulane University School of Medicine and was on the staff of the National Heart Institute, Bethesda, Maryland, before going to Emory. Doctor Cotten's appointment was effective July 1.

Richard W. Payne, M.D., has served as Pharmacology chairman since Paul W. Smith, Ph.D., resigned January 1 to join the Civil Aeromedical Research Institute staff.

Doctor Haddy will succeed M. Jack Keyl, Ph.D., who has been acting as Physiology chairman following the resignation last year of A. N. Taylor, Ph.D., now with the American Medical Association. The new chairman has been a member of the Northwestern faculty eight years. His present title is assistant professor of medicine and physiology and assistant director of professional services for research, VA Research Hospital. He received his M.D. in 1946 and the Ph.D. in 1953 at the University of Minnesota.

Menninger to Be Visiting Lecturer in Psychiatry

William Walter Menninger, M.D., on duty with the U.S. Public Health Service at the El Reno Federal Reformatory this year, has been appointed a visiting lecturer in psychiatry, neurology and behavioral sciences.

He will participate in undergraduate teaching and supervise the work of those Medical Center psychiatric residents rotating through the El Reno reformatory medical service.

Doctor Menninger is the son of William Menninger, M.D., one of the founders of the Menninger School of Psychiatry. After receiving his M.D. from Cornell University in 1957, Doctor Menninger interned at Boston City Hospital and took residency work at Topeka State Hospital and Menninger's.

Two other appointments to part-time teaching positions were made recently.

Michael Thomas Lategola, Ph.D., and Everett E. Phillips, Ph.D., both with the Civil Aeromedical Research Institute, were named associate and assistant professor of research physiology, respectively.

Pierce Named Instructor in Pediatrics

Alexander Webster Pierce Jr., M.D., has been added to the full time faculty of the School of Medicine as an instructor in pediatrics. A 1956 graduate of Vanderbilt University School of Medicine, he interned at Vanderbilt and took residency training at St. Louis Children's Hospital and Vanderbilt University Hospital.

News

SEARCH FOR TAX EQUITY

Professional men, particularly physicians, have been running from pillar to post for years in search of a fair shake on taxes. Long excluded from the tax benefits enjoyed by businessmen and others, the professions have explored three principal avenues of tax relief—special legislation for the self-employed, the creation of unincorporated associations which are taxable as corporations, and, more recently, the establishment of state laws to permit professional corporations.

This article seeks to shed at least a degree of light on a most complicated subject.

Caught in a tax regulation paradox, one which seems most unlikely in a democratic society, the self-employed have been paying more than their share of taxes into the Federal treasury. In attempting to provide financial protection for old age, the government has permitted inequalities in tax deferment to develop, with the result that persons with the same gross income are unable to prepare for retirement in the same way.

In 1942, the Federal Internal Revenue Code was modified to provide that employers may establish tax-exempt pension plans for their employees, either contributing the entire amount of the cost or sharing it with the employee. Companies may consider such contributions as a deductible item, and employees do not have to declare the employer's contribution as income. Upon retirement, the benefits to the employee are taxed according to his annual income at that time, which would generally be at a lesser rate.

Corporations have long been able to offer such advantages to key personnel such as officers, directors and shareholders, because corporate laws enable these persons to be classified as employees of the corporation. Sole proprietors and partners in non-professional occupations have been able to readily form a corporation and thereby qualify as employees.

Physicians practicing independently or as members of a partnership have been able to establish such plans *for their employees*, but, as *employers*, have been unable to participate themselves. This has been true because few state laws permitted professional corporations, and ethical considerations cast doubt on the wisdom of practicing medicine as a corporation.

The AMA clarified the ethical problem in 1957 when its House of Delegates recognized the propriety of physicians joining together as partners, associations or other lawful groups. The ethical test for such a group requires that ownership and management must rest with physicians.

With the preceding as background information, the following paragraphs are a progress report on the three routes being considered by physicians and other professional men in their search for tax equity.

Keogh Legislation

As a step in the right direction, the Jenkins-Keogh bill was introduced in Congress in 1951. Its purpose was to put some 11 million self-employed workers on a par with ordinary employees, by permitting them to set aside, tax free, a percentage of annual earned income into special retirement funds or annuities. After an encouraging start, the measure faltered in the Senate, just as similar bills have done in succeeding Congresses.

Presently, this year's model of the legislation, H.R. 10, is in the Senate Finance Committee, after having passed the House of Representatives. Since it is opposed by the Administration, and the tax deferment feature has never been too popular with the balanced-budget-minded committee, its chances of final passage this year are at best questionable.

The long range outlook for this type of legislation is good, however, and self-employed persons must keep H.R. 10 in mind as a definite possibility, weighing it against the other tax deferment alternatives described in this article. The present form of H.R. 10 will enable self-employed persons to deduct 10% of their incomes, up to $2,500 a year, provided they invest the sums in specified types of retirement plans.

Unincorporated Associations

In recent years, some physicians have acquired the tax status of "employees" by organizing unincorporated associations. This effort to acquire an equitable arrangement for tax deferred pensions resulted from the U.S. Court of Appeals ruling on the now famous Kintner Case.

Doctor Kintner and his associates were operating as a partnership in Montana and, since the state laws did not permit professional corporations, were unable to participate as employees in a tax-deferred pension plan. In order to obtain employee status, they re-organized as an unincorporated association which was so similar to a corporation that they contended it should be taxed as such. A pension plan was set up, but the Commissioner of Internal Revenue tried to tax the association's contributions as the personal income of the physicians.

The U.S. court ruled, however, that the association was taxable as a corporation and that its pension trust was qualified for tax exemption even though the physician-owners were included as participants. Internal Revenue conceded and agreed to establish criteria for determining whether an association could be taxed as a corporation, thereby qualifying for tax-deferred pensions.

Physician enthusiasm for this type program was dampened when the tax officials began a three year waiting game on drafting the final Kintner regulations. When they did appear, the practicability of forming Kintner-type associations was virtually scuttled.

In the opinion of the AMA Law Department, the final regulations amounted to nonacquiescence on the part of the Commissioner of Internal Revenue. This view was taken by AMA lawyers because the regulations provided that the classification tests would be determined to a certain degree by local laws, and most states have laws which would tend to deny a favorable ruling.

Here are the qualities which an unincorporated association must meet to be taxed as a corporation: (1) Continuity of Life. (2) Centralization of Management. (3) Limited Liability for Debts to Organization Property. (4) Free Transferability of Interest.

The Uniform Partnership Act (adopted by Oklahoma and most other states) appears to be in conflict with these criteria. For example, the provisions of this act cast doubt on the ability to establish an organization with continuity of life and centralization of management. While competent tax counsellors may be able to work their way around the conflicting statutes, there seems to be little reason to make this effort now, in view of the recent passage of Senate Bill 399, an act permitting Oklahoma professional men to incorporate.

Professional Corporation Act

The unincorporated association idea was primarily a device to fill a gap created by the absence of professional corporation laws at the state level. Oklahoma's Senate Bill 399, the Professional Corporation Act, was signed into law by Governor Edmondson on July 26th and is now available to physicians who feel they could benefit from operating as a corporation.

The declared purpose of the act is to make "available to professional persons the benefits of the corporate form for the business aspects of their practices while preserving the established professional aspects of the personal relationship between the professional person and those he serves."

Only persons duly licensed to practice a particular profession may file articles of incorporation, and the articles must state the profession to be practiced. Certificates from the regulatory board of the profession (Oklahoma State Board of Medical Examiners) must be attached to the articles, certifying that each of the incorporators, directors and shareholders are licensed to practice such profession.

The professional corporation may maintain its office in only one location, and a

doctor may only be an officer, director or shareholder in one professional corporation. Only licensed professionals may render professional services, but other employees may perform their customary duties.

Ownership of stock is restricted to those licensed in the profession for which the corporation is established. Shares may only be transferred to another licensed professional, then according to provisions in the corporate bylaws or by general agreement of the shareholders. If the shares are not transferred within ninety days after the departure of a shareholder, the corporation must purchase the shares at book value.

Advantages of a Corporation

1. The aforementioned pension plans as well as profit-sharing plans may be set up for employees—and officers, directors and shareholders would normally be considered "employees." The Internal Revenue Service has informally indicated that such would be possible. The corporate contributions to an approved plan would be deductible, and the doctor-employee would pay no tax on contributions made to the plan in his behalf or on the investment earnings of the plan. Upon retirement, the beneficiary would pay income tax on the proceeds.

2. Corporations with ten or less shareholders and having not more than 20% of income from interest, dividends, rent, etc., can be treated as tax-option corporations, the effect of which is to enable shareholders to pay individual income tax on proportionate shares of the corporate net income, rather than the corporation paying corporate tax.

3. Surplus corporate funds may be invested in real estate, mortagages, stocks, etc., and 85% of the dividend income is tax-exempt. This feature is not available, however, to tax-option corporations.

4. Fringe benefits to employees, such as life insurance, are deductible items to the corporation and the current protection is not taxable to the employees.

5. Although the corporation is jointly liable for the negligent acts of a shareholder, other shareholders are not personally involved beyond their corporate investments.

6. A corporation may deduct salaries paid to widows or heirs of employees for a limited period. Also, it is possible that the recipient will not pay income tax on such gifts.

Disadvantages

1. Centralization of management may be an unpopular requirement in some instances.

2. The requirement to purchase stock of a deceased shareholder may be a financial burden to remaining shareholders or the corporation.

3. There may be increased problems with respect to filing tax returns.

4. It would be extremely difficult for one or two doctors to form a corporation since three directors (who must also be licensed physicians) are required. Thus, less than three incorporators would have to persuade other physicians to serve as directors and these other physicians would thereby surrender their right to be involved in their own corporation. Also, it could be difficult for a one-man corporation to obtain an approved, tax-deferred pension plan.

Summary

Since the Keogh-type legislation is not presently available to professional men, and since the Kintner-type unincorporated association has been complicated by restrictive regulations, physicians who desire to establish tax-deferred pension or profit-sharing plans will probably have to incorporate the business aspects of their practices.

The decision to incorporate is a serious one, and physicians interested in doing so must weigh the advantages to be gained against the disadvantages they are sure to inherit under a corporate setup. The problems to be faced by one or two man corporations will require an even more careful evaluation of the changeover, particularly since there is no sure way of knowing at the present time whether or not an approved tax-deferred pension plan could be obtained for corporations with less than three incorporators.

The Professional Corporation Act may be of great advantage to certain doctors or

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'62 Annual Meeting— "Three Ring Circus"

Improved meeting facilities, a program featuring three simultaneous meeting rooms, and a "Town Hall" meeting for the public will punctuate several innovations in store for the 1962 annual meeting of the OSMA.

All scientific and social events of the Oklahoma City meeting will be moved into the facilities of the Skirvin Hotel and Skirvin Tower, eliminating the inconvenience of past years caused by splitting events between the hotel and the Municipal Auditorium. To further facilitate attendance, the meeting has been arranged for a weekend, beginning scientific events at noon on Saturday, May 5th, and concluding with the Inaugural Dinner-Dance on Monday evening, May 7th.

Diversified Program

A "Three Ring Circus" of scientific and socio-economic presentations has been arranged by Rex Kenyon, M.D., and his Program Committee. The "center ring" Venetian Room of the Skirvin Hotel is reserved for the presentations of eleven out-of-state speakers, and the smaller Regency and Monterrey Rooms will accommodate "side show" events on scientific subjects of special interest, as well as several presentations on economic problems.

Specialty societies are now in the process of selecting the visiting guest lecturers for the Venetian Room. Represented on the program will be the following specialties: Dermatology; Ear-Nose-Throat; Internal Medicine (2); Obstetrics-Gynecology; Pathology; Pediatrics; Psychiatry; Surgery (2); and, Urology. To date, three speakers have been confirmed: Willard E. Goodwin, M.D., University of California—Urology; Lawrence J. McCormack, M.D., Cleveland Clinic—Pathology; and James H. Ferguson, M.D., University of Miami—Obstetrics and Gynecology.

The scientific presentations in the smaller rooms will be staged by local talent and will feature special-interest discussions on such subjects as urology, obstetrics-gynecology, surgery, medicine and pathology. Plans for these rooms also include a "Socio-Economic Indoctrination Course," and seminars on "Investments" and "Legal and Tax Problems."

Movie Star Here

As a special public relations attraction of the meeting, Hollywood's Ronald Reagan will address a public forum on Sunday night, May 6th, in Oklahoma City's Municipal Auditorium. Reagan, popular motion picture and television star, has recently become noteworthy for his public appearances on behalf of conservatism in government. It is expected that he will blast socialized medicine during his Oklahoma City talk, as he has done on many other occasions.

The Oklahoma County Medical Society will co-sponsor the event with the OSMA. Tickets for Reagan's appearance will be distributed to the public by the members of the association.

Fireside Conferences

Saturday evening has been set aside for dinner meetings of related medical organizations. For those groups which conclude their special meetings in time, and for all other interested members of the OSMA, the American College of Chest Physicians will conduct six "Fireside Conferences" in the Venetian Room of the Skirvin beginning at 8:15 p.m.

These conferences are a new concept of professional education, and have been popularly received at AMA and state medical association meetings. Roundtables will be set up to accommodate about ten physicians each, and each table will have qualified discussion leaders to direct informal conversation about recent advances in diagnosis and treatment of a particular type of cardiopulmonary disease. Topics selected for the six tables are: "Management of Emphysema," "Treatment of Coronary Disease," "Modern Treatment of Tuberculosis," "Treatment of Hypertension," "Rheumatic Heart Disease," and "Bronchogenic Carcinoma."

Physicians will be able to move from table to table and discuss their problems with experts in the six subjects. Beer and soft drinks will be served by the chest physician group.

Other Events

The Board of Trustees of the OSMA will meet on Friday afternoon and evening, May 4th, and the House of Delegates will convene at 10 a.m. on Saturday, May 5th, for an all-day encounter with the business affairs of Oklahoma medicine.

President Clint Gallaher, Shawnee, will wind up the meeting as well as his presidency on Monday evening when he hands the gavel to J. Hoyle Carlock, M.D., incoming president from Ardmore. The inaugural ceremonies will take place during the annual dinner-dance, scheduled to be held in the Skirvin Tower's Persian Room. Plans are now underway to arrange for top-talent entertainment at the dance.

The annual OSMA golf tournament will be conducted on Monday afternoon, but the site of the contest is still to be selected.

Search For Tax Equity

(Continued from Page 525)

groups of doctors, but it is not an advantage to every practitioner. It depends on the doctor's tax bracket, the amount of his professional income as compared to other income, and, very importantly, upon whether or not he has extra income available to divert into a retirement program. From a practical point of view, there is little advantage to be gained through incorporation unless the doctor or doctors are prepared to go further and create a pension or profit-sharing plan, or to take advantage of some of the other permitted acts.

Use of this law and the creation of pension and profit-sharing plans are both highly technical. It is suggested by the OSMA legal counsel that physicians first talk with their accountants, requesting that a study be made to determine the approximate tax savings to be realized through incorporation. If this preliminary study looks favorable, then the physicians' attorney should be contacted regarding the actual establishment of the corporation. The advice of a banker, actuary or accountant will also be necessary to properly develop a qualified retirement program and an insurance agent will have to be consulted regarding the insurance fringe benefits available to a corporation.

OSMA Files Statement Against H.R. 4222

During recent hearings on H.R. 4222, the administration's health care bill for Social Security recipients, the Oklahoma State Medical Association was among those introducing written testimony into the permanent record of the proceedings.

President Clint Gallaher, M.D., and Thomas C. Points, M.D., Chairman of the OSMA's Federal Legislative Committee, tried unsuccessfully to arrange for oral testimony against the controversial proposal. When the request for time was not granted by the House Ways and Means Committee, Doctor Points prepared a written statement outlining the long-standing viewpoint of the association toward using the OASI mechanism as a vehicle to socialize medical care for a segment of the population.

The statement was sent to Representative John Jarman (5th Congressional District, Oklahoma) who transmitted it to Representative Wilbur Mills (Arkansas), Chairman of the Ways and Means Committee.

The OSMA's statement is printed in full below:

August 1, 1961

The Honorable Wilbur Mills, Chairman
House Ways and Means Committee
House Office Building
Washington 25, D. C.
Dear Mr. Chairman:

The Oklahoma State Medical Association appreciates the opportunity to introduce this written testimony into the permanent record of the public hearings being held on H.R. 4222 (The Health Insurance Benefits Act of 1961).

At the outset, may it be clearly established that the members of our voluntary professional society of over 1,700 doctors of medicine are firmly and unitedly opposed to this legislation. Our collective attitude toward this bill is not an arbitrary one; we oppose H.R. 4222 as a matter of principle, and as a matter of fact.

H.R. 4222 is purely and simply the beginning of socialized medicine in the United States. It will socialize hospital, nursing

home and medical care for a segment of the population, and more importantly, it provides the framework for rapid expansion to cover Americans of all ages. Many of its supporters, including the Socialist Party, are predicting and advocating such a course of events.

Thus, if Congress enacts H.R. 4222, American medicine will be taking a backward step from its present role of world leadership in health care. The experience of other countries which have adopted compulsory health care ranges from poor to unimpressive, and it would be tragic for the United States to scuttle a superior system in favor of a lesser one.

Aside from the ill-advised principle involved, no proven need for H.R. 4222 has been shown. On the contrary, the Kerr-Mills law is meeting the need of the indigent elderly much more effectively and economically than would the bill under consideration. Kerr-Mills embodies the principle of local responsibility and control; and it is designed to help those who need help.

Kerr-Mills programs are being implemented at a rapid rate by state governments, and, if given the opportunity of a fair trial, will soon result in a nationwide network of health care programs for Old Age Assistance (welfare) recipients and Medical Assistance for the Aged (near needy) recipients.

Our experience in Oklahoma with the Kerr-Mills law has been most heartening. The table below summarizes this experience since October, 1960, when our Department of Public Welfare implemented the MAA program and expanded benefits to OAA recipients.

Table of Experience
OAA and MAA Programs
From November, 1960 through June, 1961

	OAA	MAA
Persons Eligible	95,311	20,000 (estimate)
Persons Cared For	27,503	1,019
Total Cost (8 months)	$5 million	$210,000
Cost Per Case	$183.67	$206.13

These figures are even more significant when it is realized that about 50% of the state's over-65 population is covered by the OAA and MAA programs. Moreover, nearly a third of Oklahoma's over-65 people have coverage through voluntary health insurance plans. Still more are qualified to receive help through other health care programs, or are financially independent. Oklahoma medicine considered it a privilege last year to contribute over $7 million in health care service for those unable to pay.

Therefore, through a variety of means, Oklahoma's senior citizens are now able to receive high quality health care, when and where they need it. To pre-empt a proven, flexible system with H.R. 4222 would be a costly misadventure.

The adoption of the compulsory health care principle would not only deteriorate the quality of health care in the United States, but it would also mark the beginning of the end for the health insurance industry, and destroy the initiative of individual citizens and local governments who are now rising to meet the challenge of aging through local means.

Among the voluntary projects underway in Oklahoma, is a permanent Commission on Aging, now in its formative stages. Another project, indicative of a responsive public, is a multi-million dollar Senior Citizens Village, soon to be constructed in Oklahoma City. In addition, cities throughout the state have created special committees for the purpose of adding comfort and meaning to the lives of the elderly.

These programs will wither before they bloom if the Federal government tries to assume complete jurisdiction of the aged through further taxation.

Let us keep in mind, Mr. Chairman, that heavy Federal taxation has already thwarted the potential of local governments to take care of their own. Furthermore, promiscuous government spending and the resultant inflation, have thwarted the ability of our old folks to take care of themselves. At best, H.R. 4222 would not even be a short-term panacea.

Your committee is urged to join the physicians of Oklahoma (and the many others) who oppose this dangerous legislative proposal. H.R. 4222 would unnecessarily drain another $12-$15 million annually from the

pockets of Oklahoma taxpayers, to ostensibly fill a need already being met. It would nurture federal dependency and public apathy at a time when enthusiasm for local action is running high.

The American people have been regimented enough under the guise of social legislation.

Sincerely yours,
/s/ Thomas C. Points, M.D., Chairman
Federal Legislative Committee
TCP:md

AMA Clinical Meeting Set Nov. 26-30 at Denver

The 15th annual clinical meeting of the American Medical Association will be held November 26-30 at Denver, with a program geared to basic problems of medicine faced by physicians in their practice.

An outstanding scientific program, with emphasis on new research developments, has been planned under the direction of Samuel P. Newman, M.D., Denver, chairman of the AMA's Council on Scientific Assembly.

Some highlights will include sessions and papers on such important areas of medicine as genes and chromosomes, electronics and computers in medicine, space medicine, medical aspects of American habits, new developments in virology, treatment of radiation injuries, new findings in chemotherapy for cancer and latest data in the field of antibiotics and antigens, Doctor Newman said.

With more and more nuclear reactors coming into use all over the nation, many practicing physicians soon may begin to face the problem of treating injuries from radiation accidents, the chairman said.

A section of internationally known experts in the treatment of radiation injuries will offer three major papers in this important new area of medical care. Chairman will be Marshall Brucer, M.D., chairman of the medical division, Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee.

The radiation experts will discuss such topics as "Potential and Probable Sources of Radiation Accidents," "Diagnosis and Pathology of Radiation Injury" and "Treatment and Prognosis of Radiation Injury." Participants will include researchers from Los Alamos and Oak Ridge, the Office of the Surgeon General and the University of Chicago.

The age of advancing physical science also offers new findings to medical science: the use of electronics and computers in medicine. Chairman of this section at the Denver meeting will be A. H. Schwichtenberg, M.D., head of the department of aerospace medicine, Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico.

Computer systems for recording medical data to aid the physician in his diagnosis and prognosis will be discussed. Topics will include "The Future of Electronics in Medicine," "Microelectronics and New Concepts of Bioinstrumentation," "A System for Medical Data Recording," and "Biological Computers."

The virus, one of the most complex problems facing the clinician, will be the subject of a series of papers by outstanding specialists. Jonas E. Salk, M.D., Pittsburg, originator of the killed virus polio vaccine, will give a paper on "Immunization Against Virus Diseases." Other topics will include "The Nature of the Virus and Its Cellular Reaction," "Smallpox Vaccination Complications," "Virus Hepatitis" and "Identification of Viruses."

"We are confident that the 15th annual clinical meeting will offer one of the most interesting and informative programs ever presented at the winter session," Doctor Newman said.

"The program is designed to assist the physician in his practice. The latest findings in many areas of medicine will be presented by men who are top specialists in their fields. The meeting will be of great value to the clinician in advancing his knowledge."

Fall Conference Planned By OC Clinical Society

The Oklahoma City Clinical Society will open its thirty-first annual three-day fall conference at the Sheraton-Oklahoma Hotel on October 23, 1961.

The excellent program of postgraduate teaching will include lectures and discussions by fifteen noted guest speakers, selected from various medical and teaching centers throughout the nation. In addition to the general assemblies there will be specialty lectures, a clinical pathologic conference and daily roundtable luncheon question and answer sessions.

Special Features

Entertainment will include a banquet on Monday evening, October 23rd, when the Oklahoma County Medical Society will host guest lecturers and out-of-town doctors. James Q. du Pont, nationally known lecturer and administrative assistant of the E. I. du Pont de Nemours & Company, Wilmington, Delaware, will be the principal speaker of the evening. On Tuesday evening, a social hour will be followed by eight specialty group dinners. Climaxing the three-day conference, the annual dinner-dance, jointly sponsored by the Oklahoma City Chamber of Commerce and the Oklahoma City Clinical Society, will be held at the Skirvin Tower Hotel on Wednesday evening, October 25th.

Speakers Named

Guest lecturers who have accepted an invitation to speak before the group are: Ivan D. Baronofsky, M.D., (surgery) San Diego, California; Edwin W. Cocke, Jr., M.D., (otolaryngology) Memphis, Tennessee; Bentley P. Colcock, M.D., (surgery) Boston, Massachusetts; Charles W. Daeschner, Jr., M.D., (pediatrics) Galveston, Texas; Douglas M. Haynes, M.D., (gynecology) Louisville, Kentucky; Walter M. Kirkendall, M.D., (medicine) Iowa City, Iowa; Charles P. Larson, M.D., (pathology) Tacoma, Washington; E. Perry McCullagh, M.D., (medicine) Cleveland, Ohio; Donn G. Mosser, M.D., (radiology) Minneapolis, Minnesota; Robert E. L. Nesbitt, Jr., M.D., (obstetrics) Albany, New York; Edward W. D. Norton, M.D., (ophthalmology) Miami, Florida; Donald L. Rose, M.D., (physical medicine) Kansas City, Kansas; Ian M. Thompson, M.D., (urology) Columbia, Missouri; Charles E. Wells, M.D., (neurology) Nashville, Tennessee; and Jack K. Wickstrom, M.D., (orthopedics) New Orleans, Louisiana.

Registration fee for the meeting is $20.00. This includes all features during the three-day clinical. An invitation is extended all physicians who are members of their county medical societies. Further information may be obtained from Mrs. Alma O'Donnell, Executive Secretary, Oklahoma County Medical Society, 503 Medical Arts Building, Oklahoma City.

Medical Assistants to Meet in Reno

New wonder drugs, medical quackery, future training programs and professional liability are among the subjects to be considered by medical assistants when they gather October 13-15 at Reno, Nevada, for the fifth annual convention of the American Association of Medical Assistants.

More than 1,000 assistants are expected to attend the meeting at the Holiday Hotel to hear talks by physicians, professional management experts, educators and officials from governmental, pharmaceutical and military fields.

Speakers slated for the event include: Leonard W. Larson, M.D., president of the American Medical Association; Horace Cotton, contributing editor of Medical Economics; Austin Smith, M.D., president, American Pharmaceutical Association; and Oliver Field, director of the AMA's Bureau of Investigation.

The AAMA has a national membership of 9,500 women and is operating through thirty state chapters. More than 200 Oklahoma doctors' employees belong to the state chapter, headed by President Gerry Schwarz, assistant in the office of Doctors Wilkins, Herrmann and Rix, 525 N.W. 11th, Oklahoma City. Further information on the Reno meeting may be obtained from Miss Schwarz.

President Peter E. Russo, M.D., honoree Eugene Pendergrass, M.D., and Program Chairman Morris H. Levine, M.D. (from left), are shown as they review the program of the 23rd meeting of the Rocky Mountain Radiological Society.

Russo Completes Year As X-Ray Leader

Vice-President of the Oklahoma State Medical Association, Peter E. Russo, M.D., concluded his year as president of the Rocky Mountain Radiological Society when he presided at the 23rd midsummer conference of the group, held August 10-12 in Denver.

The society is comprised of radiologists throughout the Midwest, and meets each August for a scientific, business and social program. The 1961 event, held at Denver's Hilton Hotel, was attended by 250 radiologists.

Pendergrass Honored

Highlighting the scientific program of the recent meeting was the day-long tribute paid to pioneer radiologist Eugene Pendergrass, M.D., Philadelphia. Fourteen former residents of Pendergrass presented the program for the day. In addition, an Estes Park reunion of the Association of Pendergrass Fellows attracted more than 100 physicians. Pendergrass retired in June after 43 years of teaching at the University of Pennsylvania School of Medicine.

Other events of the three day conference included additional papers on diagnostic and therapeutic advances in radiology, inspection of nearly forty scientific and technical exhibits, the annual business meeting and banquet and a post convention trip to the Central City Opera House.

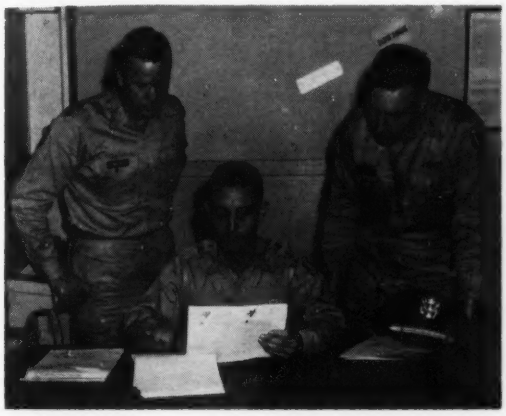
AMA to Stage Conference on Medical Aspects of Sports

The Third National Conference on the Medical Aspetcs of Sports, sponsored by the American Medical Association, will be held in Denver, Colorado, at the Cosmopolitan Hotel on November 26, 1961. The conference will be held in connection with the annual Clinical Meeting of the American Medical Association, November 26-30, 1961.

As was true of the previous conferences on this subject held in Dallas, Texas, and Washington, D.C., the Third Conference will cover a wide range of subjects. Included will be papers, panels, and discussions relating to training and conditioning, prevention of injuries, recognition referral and treatment of injuries, the psychology of sports participation and other subjects.

Those interested in receiving announcements concerning the conference should address the Secretary, Committee on the Medical Aspects of Sports, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

95th Medics



Colonel Henry Wolfe, Hugo, left, division surgeon, and Captain L. R. Diehl, right, Oklahoma City, assistant division surgeon, talk over medical plans for 95th Victory Division at Fort Chaffee, Arkansas, with Colonel William H. Reiff, Oklahoma City, division chief of staff. Colonel Reiff is also a physician in civilian life.

The 95th is one of thirteen reserve training divisions. Its mission is to operate a training center for 14,000 in the event of call up. At the Fort Chaffee summer encampment, Fourth Army gave the division an excellent rating.

Deaths

C. C. Young, Jr., M.D.
1905-1961

Fifty-five-year-old C. C. Young, Jr., M.D., Shawnee physician, died July 13.

Born in 1905 in Nashville, Tennessee, Doctor Young attended Vanderbilt University and received his doctorate from the University of Tennessee School of Medicine in 1932. His practice was established in Shawnee in 1937.

Active in medical activities, he had served as President of the Pottamatomie County Medical Society and was a Trustee from District VII of the Oklahoma State Medical Association.

Doctor Young was a Fellow in the American College of Surgeons and a member of the American Association of Railway Surgeons.

Rush L. Wright, M.D.
1882-1961

A former Director of LeFlore County Health Department, Rush L. Wright, M.D., died July 23, 1961 in Poteau, Oklahoma.

A graduate of Illinois Medical College in 1908, Doctor Wright practiced in Talihina for eight years where he served as visiting physician at the Indian Hospital before moving to Poteau.

After serving his community for over thirty years, he retired last July 1.

Doctor Wright had been secretary of the LeFlore County Medical Society.

Daniel M. MacDonald, M.D.
1891-1961

Daniel Marsh MacDonald, M.D., retired Tulsa obstetrician, died June 28 in Portland, Oregon, his home.

Born in Cleveland, Ohio, the 69-year-old physician graduated from Western Reserve University School of Medicine in 1916. After serving with the Army Medical Corps during World War I, he took graduate training in London and Edinburgh before moving to Tulsa where he practiced for 34 years. In 1955, Doctor MacDonald retired from active practice and moved to Portland.

Recognizing his service to the medical profession, the Oklahoma State Medical Association awarded Doctor MacDonald a Life Membership in 1957.

Hiram D. Moor, M.D.
1886-1961

Hiram D. Moor, M.D., former assistant dean of the University of Oklahoma School of Medicine, died August 23, 1961 in Oklahoma City.

A native of Plymouth, Vermont, Doctor Moor came to Oklahoma in 1920. He graduated from Rush Medical College in Chicago in 1929. In addition to having served as assistant dean, Doctor Moor was professor and chairman of the Department of Bacteriology at the University of Oklahoma School of Medicine.

Recognizing his service to the medical profession, the Oklahoma State Medical Association honored Doctor Moor in 1959 by presenting him with an Honorary-Life Membership.

Wilbur F. Bohlman, M.D.
1912-1961

Wilbur F. Bohlman, M.D., a Watonga physician since 1938, died August 23, 1961.

Doctor Bohlman graduated from the University of Oklahoma School of Medicine in 1937 and established his medical practice in Watonga the following year. After his service with the U.S. Army medical corps in the European theatre from 1942-45, he returned to Watonga.

Active in both medical and civic affairs, he had served as president of the Blaine County Medical Society and had been a member of the Watonga Board of Education for many years.

Auxiliary News

Fall Conference

As County Auxiliaries welcome each returning member and each new member this month, the State officers and committee chairmen welcome each of you. Fall is the "expectant" month; 1961-62 deserves much of our time and interest in the Auxiliary.

October 23rd is Fall Conference. Mark it now on your calendar. For those new memmembers, or those assuming new duties this year: annual Fall Conference is a combined training and get-acquainted event at the State Medical Building in Oklahoma City. At this time State officers, chairmen, and county presidents (the Executive Board) meet together following coffee and registration, with other county officers and committee chairmen to discuss business and to hear reports of current and future plans.

This is a fine way to meet and talk with the members with whom you will be working this year. Plan your car-pools and come!

Operation Coffeecup

During the summer our Legislative Chairman, Mrs. Clinton Gallaher of Shawnee, mailed folios of *Operation Coffeecup* to each Legislative Chairman or County President. In addition to the recording by Ronald Reagan and a commentary, you will find pertinent material from National, together with a list of senators and representatives from each state.

What is *Operation Coffeecup?* It is a sound plan, providing us with an opportunity to invite friends and neighbors in for coffee, to listen to Ronald Reagan, and to discuss trends specifically affecting every family, not just medicine in general.

Your own chairman or president has already started the coffee meetings. If you have been on vacation, or your first meeting has not yet been held, call now to reserve a convenient time for your coffee. When you do obtain the record, be certain to listen to it carefully and read the text. In the meantime, if you are not clear on legislative background, spend some time—it will prove rewarding—reading and reviewing the Forand Bill, the Kerr-Mills legislation, and the King Bill (HR-4222; referred to in the Senate at SB 909, the Anderson Bill.)

In a recent issue we made suggestions for effective discussion, particularly when legislation is concerned. Study and relax, knowing that your fore-knowledge and tolerance will be much more persuasive than the attitude: I am a doctor's wife, so naturally I oppose these measures. And don't forget: if you do not know the answer to any question, admit it; your friend will respect your honesty and be flattered when you take the trouble to secure correct information and telephone her.

One other advantage you should consider: if possible, know in advance the profession of each guest's husband, her own, if she has a profession. If you have not read the August 18, 1961, *OSMA-Scope*, do so now. Included in and following the report by Doctor Thomas C. Points, Federal Legislative Committee Chairman for the Oklahoma State Medical Association, are lists of those groups favoring and those opposing HR-4222. If we can influence individuals, obviously group attitudes can be challenged..

The title could be changed to *"Opportunity Coffeecup."* You will be pleased with the quality of the recording; you will be proud of your own contribution, maximum reward with minimum effort. You, along with your guests, will always remember Mr. Reagan's hauntingly true words: "Until one day, as Norman Thomas said, we will awake to find that we have socialism. And if you don't do this and if I don't do it, one of these days you and I are going to spend our sunset years telling our children and our children's children what it once was like in America when men were free."

25 YEARS AGO

Articles published in *The Journal* of the Oklahoma State Medical Association, September, 1936.

EDITORIAL

An Important Responsibility Highway First Aid Stations

The plan for highway first aid stations, which was first promulgated by the Fracture Committee of the American College of Surgeons and later adopted as a major activity of the American Red Cross, should receive not only the endorsement but the full cooperation of County Medical Societies.

The expense of these units is met by the local Red Cross Chapter and amounts to but a few dollars for standard equipment. The locations of the units are determined by a committee appointed by the Chairman of the local Red Cross organization and are usually placed at filling stations, tourist camps or rural stores where the services of a physician are not readily available.

It is required that the personnel of these aid stations take a fifteen hour course of instruction comprised of splint application, hemorrhage control, artificial respiration, et cetera, this course to be under competent direction and the applicant at the termination of the course must submit to an examination and demonstrate his efficiency.

These units also will have at hand information as to procuring medical attention, ambulance service and hospitalization in order that prompt disposition may be made of all emergency cases.

There is no question but what the installation of these units throughout the state will materially decrease both morbidity and mortality and the County Medical Society will be meeting its obligation to the traveling public by contacting the officers of their local Red Cross Chapter and giving their support to carrying out this very important program.

The American Board of Internal Medicine (Inc.)

The American Board of Internal Medicine, incorporated February 28, 1936, completed its organization on June 15, 1936. The officers chosen were Walter L. Bierring, M.D., Des Moines, Chairman; Jonathon C. Meakins, M.D., Montreal, Vice-Chairman; and O. H. Perry Pepper, M.D., Philadelphia, Secretary-Treasurer. These officers with the following six members constitute the present membership of the Board: David P. Barr, M.D., St. Louis; Reginald Fitz, M.D., Boston; Ernest E. Irons, M.D., Chicago; William S. Middleton, M.D., Madison; John H. Musser, M.D., New Orleans; and G. Gill Richards, M.D., Salt Lake City.

The purpose of the Board will be the certification of specialists in the field of internal medicine and the establishment of qualifications with the required examination procedure for such certification.

The first written examination will be held in December, 1936, and candidates successful in this written test will be eligible for the first practical or clinical examination which will be conducted by members of the Board near the time for the annual session of the American College of Physicians at St. Louis in April, 1937. The second practical examination will be held at Philadelphia near the time of the annual session of the American Medical Association in Atlantic City June, 1937.

The fee for examination is forty dollars which must accompany the application and an additional fee of ten dollars is required when the certificate is issued.

Application blanks and further information can be obtained by addressing the office of the Chairman, Walter L. Bierring, M.D., 406 South Sixth Avenue, Des Moines, Iowa, U.S.A.

Southern Oklahoma group desires young general practitioner for association, leading to partnership.

Write Key B, The Journal

P.O. Box 9696

Oklahoma City, Oklahoma

PHYSICIAN PLACEMENT

Anesthesiology

Richard S. Dillman, M.D., 529 Fifth Street, Ann Arbor, Michigan; age 35; married; University of Michigan, 1956; board eligible.

Dermatology

Ralph Joseph Coskey, M.D., 24631 Gardner, Oak Park, Michigan; age 32; Wayne State University; available November 1, 1961.

E.E.N.T.

James E. Harris, M.D., 511 Park Street, Birmingham 13, Alabama; age 33; Tulane Medical School; board eligible; available November 1, 1961.

General Practice

William MacLean MacRae, M.D., 118 Cambridge Street, Halifax, Nova Scotia, Canada; age 30; Dalhousie University, Halifax; board eligible; available immediately.

Gordon E. Nielson, M.D., Laie Medical Center, Laie, Hawaii; age 44; University of Utah; available immediately.

Melvin Stahl, M.D., 145 Lynn Street, Peabody, Massachusetts; age 31; Boston University School of Medicine; available immediately.

Leonard W. Rozin, M.D., 2740 N.W. 21st St., Oklahoma City; age 33; married; University of Kansas, 1959; now completing general practice residency at University Hospital; desires association in Oklahoma City; available July 1, 1961.

Irving Teague Staley, M.D., 4207 Givens Avenue, Memphis 17, Tennessee; age 32; married; University of Tennessee, 1960; available July 1, 1961.

Joe Allen Stewart, M.D., Box 337, Fountain Inn, South Carolina; age 36; married; University of Oklahoma, 1949; available immediately.

Industrial

A. G. Dandenault, M.D., 735 Lundvall, Rockford, Illinois; age 60; single; University of Manitoba Medical College, 1926; prefers general practice with some surgery; available immediately.

Frederic O. Epp, M.D., 110 West 6th, Augusta, Kansas; age 54; married; University of Kansas, 1938; desires industrial or governmental work; available immediately.

Internal Medicine

Spencer E. Berry, M.D., 13630 Flynn, Le Puente, California; single; University of Oklahoma, 1950; board eligible; available now.

James Stanford Haimsohn, M.D., 3340 Poplar Avenue, Memphis, Tennessee; age 43; married; University of Tennessee, 1942; board certified; available 90 days.

Donald Sinton Hall, M.D., 8283 Marlow, Detroit 28, Michigan; age 33; married; University of Cincinnati, 1955; available August, 1961.

Allen Bert Malnak, M.D., 1015½ Brown Street, Evanston, Illinois; age 32; married; University of Illinois, 1954; board eligible; available June or July, 1961.

Locum Tenens

University of Oklahoma graduate desires locum tenens during the months of August or September, 1961. Contact R. A. Yeakley, M.D., c/o St. John's Hospital, 1923 South Utica Avenue, Tulsa, Oklahoma.

University of Oklahoma graduate desires locum tenens, from mid-September, 1961 to mid-June, 1962. Contact Key A, The Journal Oklahoma State Medical Association, P.O. Box 9696, Oklahoma City.

John B. Tipton, M.D., 326 North Ingalls, Ann Arbor, Michigan; second year of general surgery resident in Ann Arbor, Michigan; desires 3 to 4 weeks of locum tenens in Northeastern Oklahoma. Highest recommendation available.

Obstetrics and Gynecology

Robert Russell Fahringer, M.D., 1506 13th Street, Bedford, Indiana; age 38; married; Jefferson Medical College, 1953; board eligible; available immediately.

Robert Cecil Koehn, Jr., M.D., 125 A Jupiter Street, Wichita Falls, Texas; age 33; Medical School, University of Tennessee; Board certified; available September, 1961.

Michael Lado, M.D., 999 Monroe Ave, Apt. 707, Memphis, Tennessee; age 31, married; University of Pittsburgh, 1955; available July, 1961.

J. J. McElwain, M.D., 2850 6th Avenue, San Diego, California; age 36; Marquette University School of Medicine; board eligible; available immediately.

Peter Pleotis, M.D., U.S. Naval Hospital, Newport, Rhode Island; age 30; University of Illinois; board eligible; available July, 1962.

John J. Zadworny, M.D., 419 South Waccamaw Street, Columbia, South Carolina; age 30; married; University of Manitoba, 1955; board eligible; available immediately.

Ophthalmology

Charles C. Hedges, Jr., M.D., 4119 154th Avenue, S.E., Bellevue, Washington; age 36; University of California; board certified; available immediately.

Orthopedics

J. S. Ashworth, M.D., 501 Oxford Place, Louisville, Kentucky; age 35; University of Louisville; available immediately.

George Walter Shaw, M.D., 6135 Walmer, Mission, Kansas; age 32; University of Texas, Southwestern Medical School, 1953; available, December, 1961.

Emmet J. Thorpe, M.D., 6811 Stockton Drive, Knoxville, Tennessee; age 32; married; George Washington University School of Medicine, 1951; board certified; available immediately.

Perry Merrill White, Jr., M.D., 3338 Tanglewood Drive, Augusta, Georgia; age 35; married; Baylor University College of Medicine, 1953; board eligible; available

Pediatrics

William B. Bradley, M.D., Quarters 15142, Fort Lewis, Washington; age 30; University of Cincinnati; will be board certified by January, 1962; available January, 1962.

Psychiatry

William L. Sherman, Jr., M.D., 201 East Kirby, Detroit 2, Michigan; age 38; single; Wayne State University College of Medicine, 1947; board eligible; available immediately.

Murphy Mayo Sims, M.D., 3932 Ruskin Street, Houston, Texas; age 55; Louisiana State, 1936; board eligible; available immediately.

Preventive Medicine

Robert E. Jewett, M.D., 2820 Fairway Drive, Birmingham, Alabama; age 52; widower; Indiana University, 1934; board certified; desires administrative practice; available immediately.

Public Health

Elmer W. Whitcomb, M.D., P.O. Box 16, Worawora, Ghana, West Africa; age 62; University of Minnesota; desires type of medical service practice; available April, 1962.

Radiology

Quentin T. Brooks, M.D., 6922 Edgemoor Drive, Houston, Texas; age 40; married; Oklahoma University School of Medicine, 1953; board certified; available immediately.

Edward M. Sipple, M.D., 5935 Chinquapin Parkway, Baltimore 12, Maryland; age 40; married; University of Maryland, 1951; board eligible; available July 1, 1961.

William John Super, M.D., 55 Poplar Court #4, Buffalo, New York; age 38; Saint Louis University Medical School; board eligible; available immediately.

Surgery

David S. Bachman, M.D., 301 North 2nd St., Allentown, Pennsylvania; age 38; married; University of Buffalo, 1947; board certified general surgery; specilaty, broncho-esophagology and thoracic surgery; available immediately.

John Stanley Elliott, M.D., 14 Caton Drive, East Syracuse, New York; age 31; Southwestern Medical School, Dallas, Texas; available July, 1962.

Charles Richard Fielder, M.D., 158 Bay State Road, Boston, Massachusetts; age 35; single; University of Arkansas, 1954; board certified; available August, 1961.

Donald William McMillan, M.D., 5021 Old Colony Road, Kalamazoo, Michigan; age 37; University of Michigan; board certified; available immediately.

Urology

Joseph N. Ward, M.D., 480 Emory Circle, Atlanta 7, Georgia; age 35; married; University College, Dublin, Ireland, 1949; board eligible; available immediately.

MISCELLANEOUS ADVERTISEMENTS

BIG SAVINGS ON "RETURNED-TO-NEW" and surplus equipment. Reconditioned, refinished, guaranteed. X-Ray, examining tables, Autoclaves, ultrasonics, diathermies, microscopes, OR tables, OR lights, and more. Largest stock in the Southwest. Used Medical equipment WANTED. TEX-RAY Co., 3305 Bryan, Dallas. (Open to the profession Wednesdays, Thursdays, 9-5. Other hours by arrangement.)

RECENTLY COMPLETED, and now leasing, beautiful new Midwest City medical building. Only one suite left. Contact Key O, The Journal of the Oklahoma State Medical Association, P.O. Box 9696, Oklahoma City.

PHYSICIAN EXPERIENCED in general practice, insurance and industrial work wishes opening in solo or group practice, school, industrial, institutional or government work. Contact Key F, The Journal of the Oklahoma State Medical Association, P.O. Box 9696, Oklahoma City, Oklahoma.